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THE DENTAL REVIEW

A MONTHLY JOURNAL
DEVOTED TO THE ADVANCEMENT OF
DENTAL SCIENCE

C. N. JOHNSON, M. A., L. D. S., D. D. S.
EDITOR

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THE DENTAL REVIEW.

Vol. XXXII.

CHICAGO, JANUARY, 1918

No. 1

INFECTION SENSE AND RADIOGRAPHIC DIAGNOSIS.*

BY RAYMOND J. WENKER, M. D., D. D. S., MILWAUKEE, WIS.

The progress which the dental profession has made within the past few years is scarcely short of being marvelous. And yet this progress has been made in the face of several handicaps. Perhaps the most serious have been a lack, among members of the profession, of a *combined* knowledge of medical and dental subjects, and a lack of development of the "infection sense." When William Hunter wrote his tirade on American Dentistry, although a severe criticism, and regardless of what his intentions may have been, it resulted in one of the greatest acts of beneficence ever conferred on humanity and the profession. Such expressions are creations of a mind whose infection sense is highly developed. The healing art of today needs the stimulus of such minds. The reactionist will tell you how the Radiograph finds areas of infection that do not exist. Perchance he will relate a case in which an area of infection was diagnosed and upon investigation the reactionist discovers that he extracted a tooth from that area years ago. The gum tissue has probably healed over the mouth of the alveolus leaving no visible sign of the unfilled area beneath. The X-ray man has erred. Is that not further evidence that the infection wave has been carried too far? I ask you, has the Roentgenologist erred? Why has that alveolus remained unobliterated? In some instances these sockets will even become roofed over with a layer of alveolar process. Will you contend that these alveoli are sterile and therefore harmless? Then why do they give such severe reactions when interfered with surgically? From whence is the source of infection, grown from scrapings of such alveoli? That some of these rarefied spaces may be sterile I do not question, but every one which I have examined has shown evidence of infection. Or, again, the Pacifist will relate an instance in which he "cured" a chronic alveolar abscess. The tooth has been

*Read before the Wisconsin State Dental Society, July 1, 1917.

comfortable for years. An X-ray examination shows no signs of any rarefied area and the patient has shown no systemic disturbance. Is this not sufficient evidence that the infectionists are giving us a lot of "bunk" about the incurability of chronic abscesses? Such cases, however, upon more careful investigation will usually bring to light the fact that there is infection present. A blood count, a more thorough X-ray examination and an aspiration culture test will frequently demonstrate this fact. Further analysis of the patient's condition will bring to light the fact that he is frequently suffering from pathological symptoms which he does not attribute to infection. You do not know your case until a complete history is written and a thorough physical examination is made. It is surprising how frequently antral complications are found associated with pulpless teeth which on superficial X-ray examination appear normal. Investigation will frequently bring to light the fact that the patient has been anemic for years and has had, and is suffering from obscure eye symptoms, frequent headaches, malaise, neurasthenia, digestive disturbances, high blood pressure, etc., the cause of which has not been located. Careful X-ray and culture examination of the sinuses will often bring to light a very startling condition. The patient in many instances has been through the hands of several diagnosticians, specialists in diseases of the eye, ear, nose, throat and mouth, all of whom have overlooked the fact that one or more of the sinuses contained pus and a polypoid lining. The usual slipshod methods will not bring these facts to light. Nothing but the most painstaking and thoroughly scientific methods will suffice. It is pitiful to see some of the patients beg for relief, who have been under conservative treatment by men who have no conception of pathology. Some times the treatment has been for months and some times for years. These patients beg for radical treatment to get relief, which I am frank to admit at this late period, does not always give complete relief. It is unfortunate that so many men fail to recognize the significance of infection and continue with the old idea of "curing" chronic alveolar abscesses and without the slightest conception of the patient's suffering from focal infection until it is too late to give complete relief. If chronic apical abscesses are curable by root canal treatment, without the aid of surgery, we will have to write a new dental histology and pathology and a new bacteriology. If the dentin once becomes badly infected it is a *question* whether it can ever be

sterilized while the tooth remains in the mouth, except perhaps by electro-sterilization or chemical chlorination. At least all of the old methods appear to be brilliant failures. This may be easily demonstrated by the aid of the culture method and microscope.

The acquisition of the "infection sense" may precede the application of Roentgenology, as in the case of Hunter, but the use of the X-ray, the incubator and the microscope are invaluable aids in its development. I do not pose as an extreme infectionist or surgical advocate, who cannot see any harm in the exercise of bad judgment by the over zealous, or by unscientific methods, but I do believe the reactionist with his irrational, unqualified, and sweeping criticisms must step aside and allow real progress to advance unhampered.

ROENTGENOLOGY.

In discussing this phase of my subject I cannot take the time to detail all of the technical requirements to make a good picture. Such an undertaking would be impractical at this time, because of its magnitude. I will contend myself with a very brief discussion of defects in pictures and their causes.

DEFECTIVE SHADOWGRAPHS.

In examining an X-ray the *first efforts* should be *directed toward judging the quality of the picture*. No reliable reading can be made of a defective picture. It is therefore a great mistake to attempt to read such a picture. The following are some of the most objectionable defects:

1. Insufficient or excessive density.
2. Uneven development.
3. Uneven clearing and discoloration from hypo.
4. Unfavorable posing.
5. Defective film or plate.

The question of density of the radiograph is very important. Unless the density is correct, especially in case of insufficient density, much of the existing pathology may be overlooked.

The usual causes of incorrect density are insufficient or excessive exposure, under or over development, fogging or using too old plates or films. Uneven development and clearing; if the film or plate is not plunged completely into the solution at once, and the solution which should be fresh and clean, kept moving, you may get an uneven development or clearing. Unfavorable posing may be rec-

ognized by the distortion of roots as to length, or abnormal curvature, excessive confusion by interposition of surrounding tissue which by better posing might have been avoided, etc. The manufacturer often sends out defective films with defective or an uneven distribution of the emulsion, or the emulsion may have become insensitive, due to age, or it may be spotted or fogged by careless handling in the factory or during transportation. Again, films and plates may have been poorly protected from the influence of the X-ray before intentional exposure.

ILLUMINATING OR SHADOW BOXES.

The shadow boxes in the markets are very useful for studying plates, but are too large and cause too much illumination and glare for the study of films. If the film is mounted on a ground-glass-finish-mount, as the usual celluloid mount with the ordinary electric globe in a dark room it gives a better illumination than the usual shadow box. Or better still is the dark paper mount with a celluloid window, because the eyes are thus protected from the glare of the light and it enables one to concentrate his full visual powers in the study of detail. Especially is this important when a strong light is used to study a slightly over-dense picture.

VALUES OF VARIABLE DENSITIES IN NEGATIVES.

The relative density of a shadow in the negative varies in inverse ratio to the relative penetrability of the interposed object. A shadow in ordinary sunlight is a dark area produced by an interposed object. In the presence of the X-ray "light" the shadow should be dark from an impenetrable object as in sunlight. But metal, bismuth, gutta percha, etc., appear light on the usual X-ray pictures because they are reproduced in the opposite, and are there negatives; the Eastman Company's statement to the contrary notwithstanding. The less penetrable the object the lighter the area on the negative. If the picture were a positive the opposite would be true. A print of an X-ray picture, a lantern slide and an ordinary half-tone are positives as in ordinary photography. Raper makes the statement that "the denser the part, the deeper will be the shadow thrown on the film, and consequently the more transparent the negative in that region." This statement is correct, but apt to mislead because densities and deep shadow are not transparent, except when reproduced in the opposite, as in a negative. The

lightest areas in the negative will be produced by metal fillings, posts, crowns, cast abutments to crowns, etc., then cement and gutta percha and enamel. Following this we have the variable respective densities of dentin, bone, gum tissue, cheek and lips and face preparations as flake white, etc. The use of lead face preparations, lead paste, etc., effect the density of the whole picture in the field so covered and vary according to the thickness and the amount of lead it contains. Pulp chambers, unfilled canals and rarefied areas appear dark; filled canals if gutta percha, cement, or bismuth, and pulp stones appear lighter than the dentin. Soft tissue tumors, sequestra, etc., appear slightly darker than the surrounding tissue. Normal sinuses, inferior dental canal, mental foramen, cavities, etc., show darker than the surroundings.

KNOWLEDGE OF THE NORMAL ANATOMY, HISTOLOGY AND THEIR VARIATIONS ESSENTIAL.

I believe it is absolutely essential to satisfactory reading of X-rays to have a good working knowledge of the histology and anatomy of the parts examined. It is self evident that no man can make a reliable reading unless he has a good working knowledge of the normal minute and gross construction of the parts examined. Common errors are to mistake the antrum, mental foramen, nasal cavity, inferior canal, photo defects, etc., for pathological conditions.

I believe, however, that a man totally ignorant of anatomy and pathology may become an adept automaton. That is, learn to mechanically recognize certain pathological characteristics by careful guiding and training under a competent teacher. Such an individual, however, is working without a scientific anatomical or pathological basis and cannot reason on the proposition except mechanically or electrically perhaps. And therefore all border line cases and new variations in his field of observation are beyond his skill. There are so many variations of the antra, bone texture, forms of teeth and roots, canals and foramen in the bones that a large experience coupled with a thoroughly scientific knowledge and good X-ray judgment are essential. Partitions or strong dip of the antra, unusual location and size of mental foramen and inferior dental canal may lead to error. The variations in density and texture of bone and process may mislead in reading.

VALUE OF PRACTICE IN READING A LARGE NUMBER OF PICTURES.

The correct reading of a few pictures may make a man overconfident, but an earnest desire for the truth, coupled with a studious effort to acquire it, will do much in the development of the Roentgenologist, provided he has a natural talent in this field. I have frequently restudied my films and plates and each time I do so I learn something new in some phase of radiography.

KNOWLEDGE OF THE PATHIOLOGY AND VARIATIONS ESSENTIAL.

A granuloma because of its usual sharply circumscribed character is the most easily recognized, whereas a chronic otitis, sequestra, small fractured root ends, incomplete necrosis, granuloma in the root bifurcations, increased density and cloudiness in the antrum and other sinuses, especially border line cases are difficult to read and require a great deal of study of the peculiar characteristics of nasal and oral pathology. A gray or hazy sinus may or may not be diseased. When a gray sinus is present, a very careful study of the condition of the neighboring teeth and nose are indicated and an aspiration test should be made before making a positive diagnosis. Syphilitic otitis, Ranula, Neoplasms, etc., are also very difficult of correct reading.

MISCELLANEOUS KNOWLEDGE OF IMPORTANCE.

In addition to the preceding knowledge, a successful radiographer must be a student of physics, chemistry, electricity, method of surgical and dental practice in his field of activity, etc., etc.

WHAT INFORMATION MAY AN X-RAY CONVEY?

Radiographs are merely recorded evidence of the variable X-ray penetrability of matter. With the present development of radiography, the gross and not the minute pathology is elicited. In other words the pathology is portrayed, macroscopically not microscopically. Nor are all of the points of evidence of the gross pathology brought to light. My experience has taught me that a great deal of pathology very frequently exists which I cannot bring to light except by surgical and microscopical aid. Especially is this true in acute pathology and in the extensions of disease caused by recent acute exacerbations of chronic foci. A general focus may be clearly evident but a relighting of the old process may produce unrecognizable extensions immediately surrounding the old focus. Then again in chronic pathology it is usually easy to rec-

recognize any destruction of tissue that is located on the proximal sides or beyond the apices of any of the teeth as these areas are not obscured by the teeth. Or, in other words, as the X-ray penetrates through the tissue from the labial or buccal side and passes to the film on the lingual side, all the pathology which may be located between the teeth and beyond the apices is usually clearly photographed on the film; while any pathology which may happen to be located on the labial, buccal or lingual sides of the teeth may not be pictured clearly enough to be recognized. This is true more especially in case of increased density of the teeth and the process and where the pathology covers a small area, or is shallow labio or bucco-lingually, and where it is sharply outlined.

UNRELIABLE X-RAY READING.

That there is a certain amount of unreliable X-ray reading is quite a natural thing to expect, especially at the hands of the novice and diagnostician, ignorant of the minute and gross anatomy with their numerous variations both in health and disease. On the other hand, some of the fallacious reading may be due to unscrupulous tendencies. While the complaints are fairly numerous, I have been surprised, considering the large amount of X-ray work undertaken, to have come in personal contact with so little poor work in this line. I know of one instance in which four pictures were taken of a kidney and in each one a stone was elicited, but upon operating, no stone was found. Another instance where a molar tooth was apparently located in the nose. In the case of the kidney there is one of two explanations to be given. Either the object appearing to be a stone was extra renal, or the surgeon was at fault in not locating it. In the case of the molar in the naris, a large inferior turbinal bone and a spur on the septum were X-rayed in such a direction as to suggest the form of a tooth. Subsequent pictures of this case, taken at different angles, did not elicit the tooth. Many other instances along this line might be cited. Nevertheless these are but a small percentage of the total number of X-ray diagnoses.

SHOULD THE X-RAY DIAGNOSIS SUPPLEMENT OR SUPERCEDE THE CLINICAL?

In a broad sense and generally speaking, the X-ray should be used to substantiate, supplement and amplify the clinical diagnosis. By following this plan the skill in clinical diagnosis may be very

highly developed, while if the reverse order were adopted the clinical art would be lost. The use of the X-ray tends strongly to lead one away from a clinical study of his problems. Exceptionally the clinical picture is so obscure that it becomes necessary to depend almost entirely on the X-ray findings for a diagnosis. This is especially true where there are no local subjective symptoms and where the objective and remote symptoms are poorly defined. This type of cases are to be found among the chronic apical infections, supernumerary, unerupted and deeply buried teeth, etc. With these exceptions we still have the majority of cases in which a clinical diagnosis may and should precede the X-ray study. On the other hand, especially in acute pathology, the clinical manifestations may be the only dependence in making a diagnosis. In the early stages of acute inflammation before any gross destruction of tissue has taken place, the X-ray findings are unsatisfactory. This is likewise true in acute extensions of pathology surrounding chronic foci. This point about acute processes was previously referred to and is repeated for emphasis.

WHEN IS SURGICAL INTERVENTION INDICATED?

Upon the degree of development of the infection sense, the extent of knowledge in medical and dental pathology and the power of keen clinical observation, all other things being equal, will depend the answer to this question. The infection sense is undeveloped in a large majority of the dental and in a smaller majority of the medical profession. A combined knowledge of both medical and dental subjects is very deficient in both professions. Without the infection sense, the essential knowledge of pathology and the practical application of these points in a thorough clinical study the correct answer to the foregoing question cannot be given. There are so many factors connected with this question which play a *relative* part in it, that a clear, definite answer, in every detail, is very difficult to give and many points of it would probably be rejected by the profession at this time. I will therefore confine myself to general statements in my answer. But before answering this question let us note some general points in pathology and repair. Whenever a pathological process develops in an organism, it does not matter where, to what extent or how long it persists, some destruction of a highly functioning tissue takes place. The repair, if any, which will follow in the wake of this process, will consist of a tissue

of a *lower* functioning power and capacity. Destruction of tissue by a chronic inflammatory process is usually repaired, if repair takes place, by scar tissue, exceptionally it is replaced by calcarious deposition, it does not matter whether the process be nephritis, a tuberculosis, an arteriosclerosis, a pyorrhea or an apical dental abscess. In each case original highly functioning tissue is destroyed and the repair consists in replacement or patching with scar tissue or calcarious material or both. In all chronic apical abscesses and in all chronic gingival inflammatory processes a portion of the peridental membrane is destroyed which is never replaced unless it be by scar tissue.

SURGICAL TREATMENT

All cases of chronic alveolitis or pyorrhea, if treatment is undertaken, require surgical intervention in the nature of scaling and polishing to remove irritating foreign material. Emetin injections *without surgical intervention* in the treatment of pyorrhea is still quite evident in some sections. That this is done rationally and conscientiously I have serious doubts, and I for one, wish to raise my voice to protest against such methods. All chronic apical abscesses require surgical treatment, whether extraction and curettement or amputation and curettement. Conservative surgery, namely, apicectomy is indicated in selected cases. The most favorable are those where there is no evidence of metastatic foci, or remote systemic disturbance and only in the anterior teeth and in cases where the destruction is circumscribed in the apical one-third of the root. In proportion as systemic disturbances become more marked, and age and vigor of the patient becomes less favorable, conservative surgery is less and less indicated, and radical is indicated instead. In all molars, with few exceptions, affected with chronic apical pathology, whether ostitis or a granuloma, extraction and curettement are indicated. One exception to this proposition may be where one root only is affected, in which case that root may be amputated at the crown and the entire root extracted leaving the other root or roots of the molar in place. In all *acute* abscesses in which the X-ray findings do not indicate destruction of the peridental membrane and the clinical diagnosis does not indicate otherwise, surgical intervention in the form of drainage may be indicated. If necrosis of much of the alveolar process or much destruction of the peridental membrane has occurred, extraction and curettement may

be indicated. Acute exacerbation of chronic abscesses are frequently diagnosed as acute abscesses and treated as such. The toy poultices in various forms are still quite commonly used in the treatment of this and other types of cases. So likewise is the lazy man's mummifying paste frequently used, all to the disgrace of dentistry. In acute pathology as in chronic, the more unfavorable the age and health of the patient, the more is radical surgery indicated.

VALUE OF SURGICAL AND MICROSCOPIC VERIFICATION OF X-RAY
FINDINGS.

It must be an uninteresting monotony for the man who does nothing but take X-ray pictures with but little or no opportunity to personally verify his diagnosis. As previously indicated the X-ray findings often fail to elicit all of the existing pathology or perhaps the findings are indefinite and doubtful. In such a case there is great danger of finding pathology which does not exist in order to satisfy the patient or the party referring him, both of whom may have their expectations greatly magnified. Nevertheless, it is always wise to make a conservative diagnosis and if there is not pathology evident upon repeated clinical and radiographic examinations, the patient or the party referring him, should be so informed. On the other hand, when there is pathology present, an opportunity to operate on the field offers the most instructive and convincing evidence of the correctness or incorrectness of your diagnoses. If you have been rational and conservative your surgical and microscopical findings will always elicit fully as much and frequently more pathology than outlined in the clinical and X-ray diagnoses.

X-ray illustrations are numbered and following is a brief notation of each. Only points of interest are included in the description.

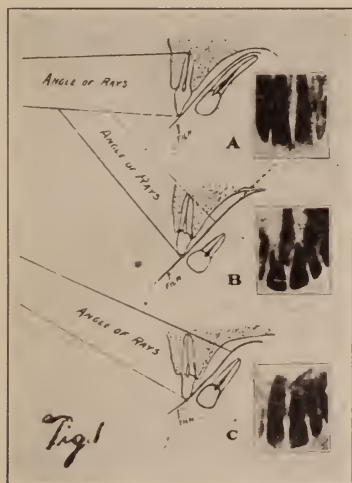


Fig. 1.

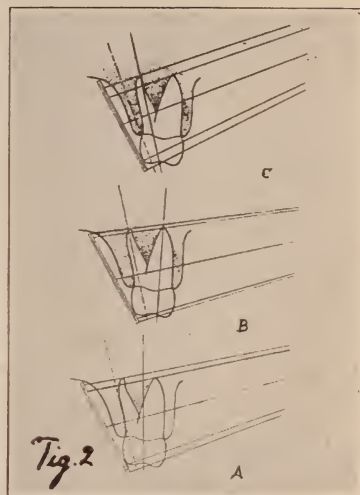


Fig. 2.

Fig. 1. Correct and incorrect Technic. (McCoy.)

Fig. 2. a. Correct angle for general view.
b. Correct angle for buccal roots, and
c. Correct for lingual root. (McCoy.)

Fig. 3. See note on this figure.

Fig. 4. View of sinuses in dry skull. Note upper third molars posterior to antra. These teeth lie horizontally with occlusal surfaces facing posteriorly.

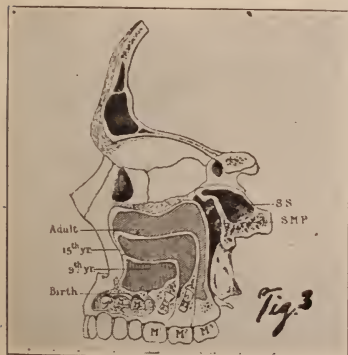


Fig. 3.



Fig. 4.



Fig. 5.

Fig. 5. Mrs. A., age 30. Well nourished. First molar extracted one year previously but mesial root fractured and left in socket. Entire socket had roof of process covering at periosteal opening. Clinical examination showed no signs of a buried root or unfilled socket. History of neuralgia pain in jaw and side of face. Marked aggravation of symptoms for 10 days after surgical intervention consisting of removal of root and thorough curettement of entire socket. Subsequently gradual and continual improvement to complete relief in three weeks.

Figs. 6 and 7. Mrs. G. I. Age 45. Well nourished. Artificial denture worn over root several years which was completely covered with gums. Became inflamed and X-ray explained cause. Antrum not involved. Surgical removal gave prompt and perfect result. No reaction.

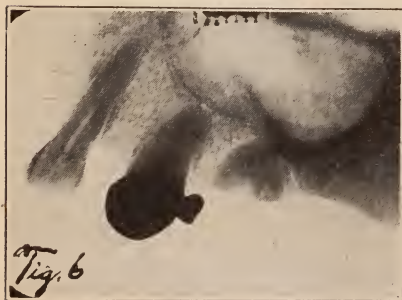


Fig. 6.



Fig. 7.



Fig. 8. Miss M. Age 40. Well nourished. Buried root completely covered with gum tissue and process. Frequent viscusulation of covering gum was the only symptom. Surgical removal and flap of gum closed immediately. Rapid healing and cure. Very slight reaction.

Fig. 8.

Fig. 9. Mrs. B. Age 22. Deaf and dumb patient; very poorly nourished. Second bicuspid completely buried. Occlusal surface facing lingually. Made flap opening and removed tooth under local anesthesia. Flap closed, suppuration interfered with prompt healing. Subsequent temperature 100 for two days. Complete prostration. In two weeks patient discharged cured. Slight return of hearing an unexpected result.



Fig. 9.



Fig. 10.



Fig. 12.



Fig. 13.

Fig. 10. Mr. J. H. Age 45. Fairly well nourished. No symptoms except flow of pus. Chronic ostitis located between upper cuspids. The incisors had been extracted over a year and were probably abscessed and no curettement at time of extraction. Bone soft over area. Thoroughly curetted and flaps closed immediately. Blood clot in wound did not become infected. Healing by primary intention. No reaction.

Figs. 11, 12, 13 and 14. Miss L. Age 18. Well nourished. Pronounced pyorrhea and arthritis of knee joint. Physical and blood examination negative. Fifteen teeth extracted, a few at a time, and curetted field thoroughly. Marked reaction after each operation, temperature, prostration, etc. Complete recovery in several months.



Fig. 11.



Fig. 14.



Fig. 15.



Fig. 16.

Figs. 15 and 16. Dr. B. Age 50. Well nourished. Right antrum infection due to abscessed cuspid; apex of tooth extended into antrum. Implantation of bicuspid many years previously in which floor of antrum was perforated may have been a factor. Radical antrum operation and extraction of cuspid and second molar which latter was pulpless and a partial factor, resulted in complete recovery.

Figs. 17, 18 and 19. Miss F. Age 27. Moderately well nourished. Root resection using silver screw designed by author. Fig. 18 taken immediately after operation and Fig. 19 taken four months later.



Fig. 17.



Fig. 18.



Fig. 19.



Fig. 20.



Fig. 21.

Fig. 20. Mrs. Z. Age 30. Moderately well nourished. Granuloma involving lateral, cuspid and first bicuspid. No symptoms except moderate local redness and slight general nervous manifestations. Extracted cuspid and bicuspid and resected lateral incisor and curetted out very tough, thick, pus sack and sutured flap back immediately. Flap sloughed completely off and cavity filled up by granulation, leaving depression in gum.

Figs. 21 and 22. Mrs. R. Age 45. Poorly nourished. Buried cuspid lying horizontally in edentulous jaw. History of one-sided headaches and "Catarrh" of nose, and throat and stomach, loss of weight, anemia, nervous symptoms, etc. Complete loss of senses of smell and taste for three years due to suppuration. Abscess size of large hazel nut surrounding crown of tooth drained through fistula in roof of mouth. Previously diagnosed as necrosis of maxilla. Clinical diagnosis, buried cuspid. Confirmed by X-ray examination, cuspid removed and field curetted. Apex of cuspid extended into antrum. Flap closed immediately, leaving a large drainage, through length of socket to antrum. One week later performed radical ethmoidal operation. In another week performed a radical antrum operation. Apparently complete recovery from all symptoms, including complete return of senses of smell and taste. One year later a gradual increase of pus secretion from nose appeared. Have not diagnosed its source nor treated it, but suspect it comes from other sinuses on same side or is due to ozena.



Fig. 22.



Fig. 23.



Fig. 24.



Fig. 25.

Figs. 23, 24 and 25. Mrs. H. M. Age 50. Poorly nourished. Sclerotic, pronounced loss in weight, secondary anemia, high blood pressure, gastric and nervous symptoms, subnormal temperature, pharyngeal, nasal and gastric "Catarrh", sinusitis, etc. Adenoid type, nasal "Catarrh" 15 years standing. Cleaned up by surgical means, various parts of mouth, not all illustrated, in slow stages and performed a Leu Caldwell antrum operation, left side. Patient still under treatment and making excellent progress. All symptoms disappeared except loss of weight and blood pressure which show improvement.

Fig. 26. Mr. B. Age 30. Well nourished. Necrosis and acute antrum infection right side. History negative. Extracted first bicuspid, removed several small sequestra and drained and irrigated antrum. Discharged, completely recovered in four weeks.



Fig. 26.



Fig. 27.



Fig. 28.

Figs. 27 and 28. Miss N. M. Age 40. Well nourished and vigorous. Abscess extending to floor of nose and into antrum. Lateral previously extracted. History negative, except local symptoms of frontal and one-sided headaches, nasal and pharyngeal "Catarrh."

Performed the Good frontal operation, radical ethmoidal and antrum operations and resected central curetting granuloma thoroughly. Patient still under observation and making excellent progress.

Figs. 29 and 30. Mrs. J. K. Age 50. Well nourished. Patient presented with X-ray shown in Fig. 29 had acute exacerbation of chronic apical abscess. Clinical examination by heat and electric means gave negative results when applied to lateral incisor. Drilled into lateral and found pulp alive but slightly insensitive and gave slight hemorrhage. Treated for a week to reduce acute symptoms. Resected lateral and cuspid and inserted silver screw in each (?). X-ray Fig. 30 shows that the silver screw in lateral was not placed in canal but to one side of root. Patient from Chicago. Neglected treatment of lateral and refused to have screw removed and correctly placed.



Fig. 29.



Fig. 30.



Fig. 31.



Fig. 32.

Figs. 31 and 32. Mr. M. Age 40. Poorly nourished. Chronic nephritis, secondary anemia, high blood pressure, headaches for five years, history of traumatic accident in cuspid region. Patient took acetanilid compound for two years for headaches, other history negative. Local symptoms; subperiosteal abscess size of almond nut in canine fossa, pyorrhea and apical abscesses of cuspid and both bicuspid. Extracted above three teeth and curetted field. Made flap opening and curetted subperiosteal abscess and sutured flap. Antrum not involved. Recovery of local suppurative condition complete. One year subsequently patient died of nephritis.

Figs. 33 and 34. Mr. T. Age 25. Farmer; good habits; well nourished. Pronounced osteoperiostitis of several years standing. All teeth very loose. General physical examination negative. Negative Wasserman; negative urine; negative blood; blood pressure 140. Well nourished and developed; excellent health. Infection Vincent's Angina. Extracted 32 teeth in slow stages. Considerable reaction after each operation, such as nervous symptoms and malaise; rise in temperature, etc. Complete recovery in four weeks.



Fig. 33.



Fig. 34.



Fig. 35.

Fig. 35. Mr. Z. Age 30. Well nourished and vigorous. General physical examination and history negative. Five years previously a surgeon (?) made a triangular incision through cheek below malar process to enter antrum. Patient presented with pronounced acute exacerbation of antral symptoms. Clinical examination of local conditions showed marked trismus, temperature 101; moderate swelling and marked tenderness. Cuspid missing and no history of extraction. Heavy scar band extending from malar process to mandible made it very difficult to enter antrum through canine fossa even under ether anesthesia. X-ray examination showed foreign objects in antrum. Opened antrum for drainage and treated for ten days, when acute symptoms completely subsided. Then performed Leu Caldwell on antrum, removing several sequestra and buried cuspid crown which was decayed completely through at neck of tooth. Part of orbital and nasal bony walls of antrum were destroyed but covered with soft tissue. Several weeks later removed root of cuspid under local anesthesia from anterior upper corner of antrum. All pulpless teeth and those affected with mild form of pyorrhea became sufficiently active following last antrum operation to keep up a slight continual temperature. After their extraction and curettment of sockets complete recovery resulted. Period of treatment, four months.



Fig. 38.



Fig. 37.



Fig. 39.

Figs. 37, 38 and 39. Mrs. K. Age 26. Moderately well nourished. Dentigerous cyst. Produced deformity of face and interfered with speech for eight years, caused absorption of apices of contiguous teeth. No pain, very slow growth, all walls hard. X-ray examination shows walls around cyst are very thin. Cut window into cyst and peeled out entire sack with permanent lower cuspid which stood in perpendicular position in anterior lower part of cyst. Contents of cyst very thin clear liquid slightly yellow in color. Very slight temperature reaction and swelling, no prostration or nervous symptoms following operation. Cystic cavity is gradually reducing and still under observation.

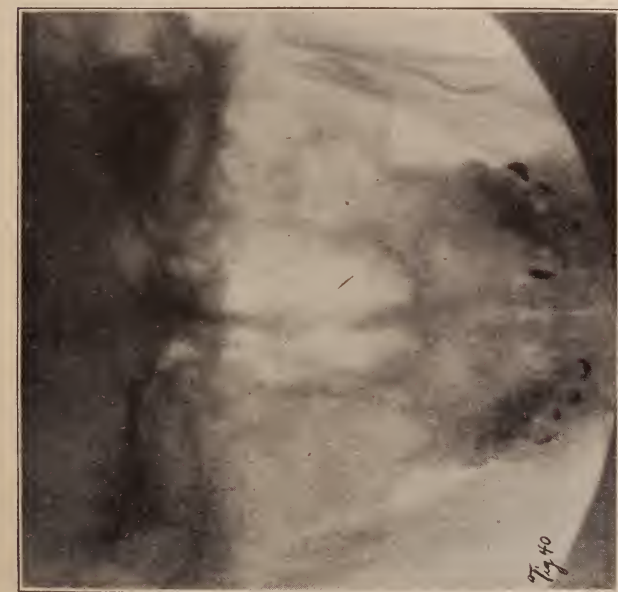


Fig. 40.

Fig. 40. Miss T. Age 40. Poorly nourished. Emaciated, anemic, low energy, mental torpor, general chronic atrophic sinusitis, Case not treated. Prognosis very poor.

Fig. 41. Mr. R. Age 45. Well nourished; slightly sclerotic. Subacute antrum infection, right side, due to molar tooth. Local symptoms of infraorbital pain, tenderness and swelling. Extracted tooth, curetted and irrigated antrum. Under treatment several months. Result excellent.



Fig. 41.

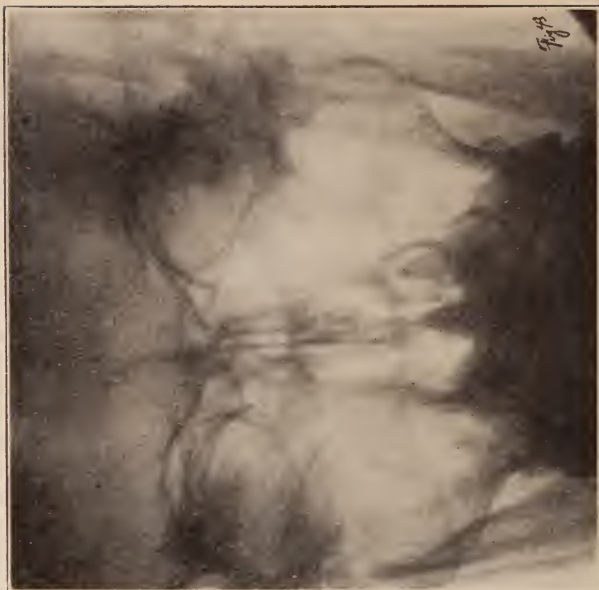


Fig. 43.



Fig. 42.



Fig. 44.

Fig. 42. Mr. F. R. Carpenter. Sclerotic, good habits, urine and blood negative. Acute toxic neuritis of left 5th nerve due to infection from molar teeth extending to antrum and ethmoidal cells. Extracted teeth and curetted field and antrum and later closed antrum and patient discharged. Because of septum deflection interfering with drainage anterior ethmoidal cells became involved few months later and was completely relieved by submucous resection of septum. No return of symptoms in eight months.

Fig. 43. Dr. W. H. Rockford, Ill., Age 40. Well nourished. Right antrum infected. Had preturbinal operation on antrum. Results unknown.

Fig. 44. Mr. W. N. Attorney. Sclerotic; poorly nourished and anemic. Blood examination otherwise negative. Urine negative; habits excellent. Very chronic pan sinusitis. Diagnosis overlooked by several specialists. Infection due to pneumococci. History of "Catarrh" of nose with expectoration of pus-stained mucus for forty years. Partial loss of memory and weight. Never had any acute symptoms. One pulpless abscessed molar was discovered and extracted and field curetted but not connected with the antrum. Pus in antrum as thick as 600 W. Auto oil and as foul as the ripest egg I ever smelled. Radical operations were performed on nearly all the accessory nasal sinuses except sphenoidals which are still secreting pus. Treatment has extended over a period of 12 months; still under observation.



Fig. 46.



Fig. 45.

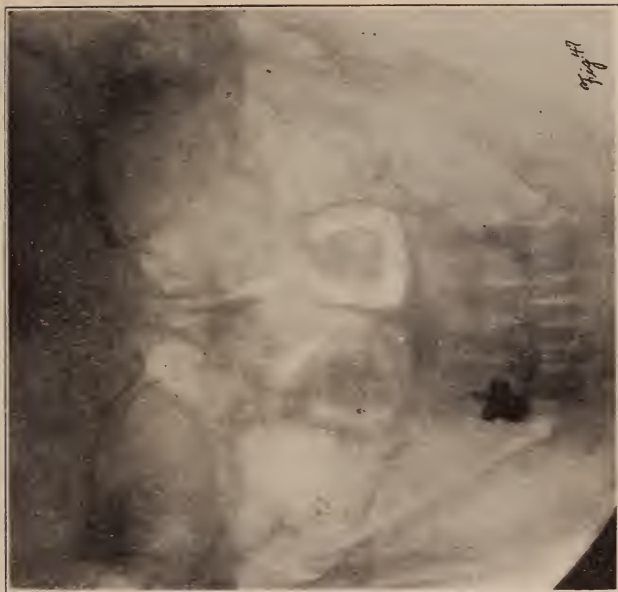


Fig. 47.

Figs. 45 and 46. Mrs. H. S. Age 40. Well nourished. History negative. Acute toxic neuritis of left 5th nerve. X-ray examination of mouth showed several small abscesses of teeth, which teeth were extracted and field curetted but none extended into antrum. Left antrum, however, was suspected because of the pain and tenderness in the inframalar region. X-ray of head and examination of nose and antrum showed left antrum to be free from disease. Fig 45, however, shows an upper molar tooth (?) in left nares. Fig. 46 was taken to determine the truth of this and found negative. Complete relief of pain was not given until followed with massage. Result perfect.

Fig. 47. Mrs. M. D. S. Age 45. Well nourished. History of one-sided headaches. Sinuses suspected. Left antrum irrigated and found about 10 grains of finely powdered grey debris but no pus. Extracted two upper pulpless cuspid. Peridental membrane of each was markedly congested but apparently not abscessed. A few nasal treatments to improve sinus drainage and symptoms cleared up.



Fig. 52.

cough and mild ex-
amination negative. Clinical and X-ray
periapical infections.
Upper right cuspid was resected
following each operation



Fig. 49.



Fig. 51.

Well nourished. Nervous symptoms, loss of weight and appetite,
Physical, blood and urine examination negative.
T. B. Physical, blood and urine examination negative.
of both antra, of short duration, and numerous periapical infections.
Marked reaction following each operation
slightly.



Fig. 48.



Fig. 50.

Mrs. H. K. Age 35. Previously diagnoses as incipient pulmonary T. B. Physical, blood and urine examination negative.
All the affected teeth except upper right cuspid were extracted in slow stages and field thoroughly curetted. Upper right cuspid was resected
and silver screw inserted in apical end of canal. Both antra were partially curetted and irrigated. Marked reaction following each operation
on jaws and antra. Recovery in six months complete except one antrum still open and draining slightly.

A REVIEW OF THE PATHOLOGY OF THE PERIDENTAL MEMBRANE.*

BY FREDERICK B. NOYES, B. A., D. D. S., CHICAGO.

[NOTE.—The research work described in Dr. F. B. Noyes' paper was done for the Research Commission of the National Dental Association and the illustrations will be published in the *National Journal*. The publication for both the State and National Societies has been much delayed by the theft of all the lantern slides for the illustration of the research work. They will have to be laboriously reproduced.—EDMUND NOYES, Editor.]

When I promised to give this paper for the society, it was my idea to review somewhat the literature, but more especially the work on this subject that has been under way for about two years now under the auspices of the Research Commission of the National Dental Association.

There are few things in dentistry that have had a larger volume of writing in the last few years than pyorrhea and the diseases of the soft tissues, but in reviewing the volume of literature, you will find that almost all the writing is concerned with treatment and the clinical aspects of the subject. There is in most of the articles more or less of a review of the normal structure of the tissues and their physiology, but there is almost nothing showing the anatomical, the microscopic condition of the tissues in the disease itself.

In going over the literature in English, French and German as carefully as we could we found that there is practically but one description of the tissues in the pathologic conditions, with illustrations, that we were able to find, and that was by Roemer, a noted German histologist and investigator, published quite a number of years ago. In this country there have been a few isolated articles with a little material, but as a general statement that one article is the most comprehensive and includes more ground and more illustration than any other one piece. For the last two years or more we have been collecting material and trying to get at something of the conditions that present themselves in the various stages, types and aspects of the conditions that we have grouped together

*Read before the Illinois State Dental Society, May, 1917.

under the name of pyorrhea, and the longer I have worked at this, the more I have begun to feel that this type of attack of this problem was the only one which was liable in the end to bring something like order and relationship out of the chaos of material at the present time. If you go back over the literature you find two main points of antagonism over the question of systemic or local origin of the disease. One school believes the conditions are the result entirely of local conditions, and that the treatment of the local conditions will eliminate entirely the disease, the other school believing that the conditions are dependent upon systemic conditions which make, possibly, the beginnings of the local causes. I think that possibly in the study of the anatomico-microscopic appearance of the tissues we are going to find some relationship between these two apparently antagonistic ideas.

Before I turn to the lantern slides, I want to speak of one or two things which Roemer made very clear in his writing.

According to his interpretation, the conditions themselves are dependent upon a lowering of resistance; that all of these conditions are infectious, and from microscopic standpoint, the results in the changes of tissue structure are the changes which follow in the footsteps of infection. But Roemer emphasizes the fact that these infections do not occur as long as the tissues are growing. We do not find these gum troubles, these diseases beginning in the gingival space and involving the peridental membrane, in young people of ten, twelve, fourteen, sixteen, and eighteen years of age. It is only after full development is reached that we have these conditions appearing, and he emphasizes the fact that during the development period the cellular activity of these tissues is sufficient to protect themselves against the invasion of infection. Considering the problem in every aspect, we must remember, in the first place, all of these conditions are infectious, and that the changes in the tissue are reactions to an infection, and that in order to have infection occur there must be a lowering of local resistance. That lowering of local resistance may be brought about by a general systemic condition which lowers the local resistance, or it may be brought about by any one of a great variety of things, like injuries or things which act like injuries, such as accumulations of irritants at the margins of the gums, tartar or calculus, and any other con-

dition which, acting as a local cause lowers the resistance of the tissue and affords an opportunity for infection.

Our attention in the last few years has been strongly drawn to the mouth as a point of systemic infection. In that connection, let us stop to think a minute of conditions. Think of the skin, and if you think of the pathology of the skin you will find that most of the infections through the skin have their entrance through the hair follicles or nail folds, or gland ducts, things which communicate from the surface of the skin to the underlying tissue. Remember, the teeth bear the same relation to the mucous membrane of the mouth, in a very striking way, that the hair follicles bear to the skin, and that the mouth has added to the conditions which you have present in the skin, instead of a dry condition, which is antagonistic to microorganism development, and the process of infection, a constantly moist condition which is in favor of infection. The temperature favors to the greatest extent the growth of microorganisms, while the skin temperature is never quite up to that point. Not only is the moist condition and the temperature condition ideal, but the very fluids and materials which are constantly present in the mouth are ideal culture materials, so that if you have but one pathogenic organism introduced into the subgingival space, it in a few hours is legion. With these ideas in mind, see what an opportunity there is, with the conditions at the margins of the gums, and the free gingivae, for the entrance of infection and for the beginning of these conditions. When you add to that the fact that the teeth are used three times a day in masticating hard foods, and incidental to the functional process injuries to the tissues occur constantly, and every injury results in a temporary lowering of local resistance and the furnishing of an additional opportunity for the entrance of infection. The whole consideration then of the pathology of the supporting tissues must be laid on some broad general conceptions, and then it must be worked out into its ramifications and details.

In presenting a review of conditions, I am going to try, rather than present details of scientific interest, to build up, if possible, some conception of how the tissues change from the normal to the abnormal in the progress of these conditions, so that we can have some conception of, first, the normal and the arrangement of the tissue elements in the normal condition adapted to the purpose of

normal function, and then how these normal conditions are upset and changed by the progress of the pathologic process.

We must know to what extent and in what way the tissue is changed, so that we may have some basis for our judgment as to the possibility of return of those tissues which are in the abnormal and pathologic conditions to the normal and functional condition. I realize from the efforts that I have made personally, to get some order out of a mass of material, it is not easy to build up that kind of conception. It is not easy to picture to one's self in detail the minute microscopic structure of the tissues in their normal condition, and then when you are trying to build up a picture of the progressive change from the normal to the abnormal, especially when you have a good many different processes that are all tangled up together, it becomes an exceedingly complex and difficult thing, so that if I present only one or two things which have fairly well crystallized out of what has been going on in the laboratory the last two years, you will perhaps not think it too little a thing to do.

I want you to realize that in thinking of the progress of the conditions that we call pyorrhea from a clinical standpoint, and I know because I have thought of the thing from that standpoint, we have been accustomed to think of the condition with relation to a pocket, a detachment of the tissues from the surface of the tooth, and we have always had a picture in our minds that if we could cure the pocket we were eliminating the condition. If you do not get anything else from the pictures I am going to show you this afternoon, I want you to get the idea that the pathologic conditions in the tissues extend away beyond the bottom of these pockets. The bottom of the pocket is where it begins and the tissues have changed from their normal relationship away beyond that point to a very great extent, to a much greater extent than we have had any idea of, and I do not think you will grasp that until you cut some of the sections for yourselves.

With reference to the reversion to normal, in a good many instances at least the depth of the pocket from a clinical standpoint, we must remember, is exaggerated by the swelling in the tissue, and when the inflammatory condition in the tissue has subsided, the pocket may seem to be a good deal shallower than it was when you treated it, and it will not be at all, because the detachment is at the same point. Where the tissue is swollen, you have a great deep hole

down there. After the inflammation has been reduced in that tissue, or after the inflammation has subsided, do not think the pocket has healed up from the bottom simply because the pocket is not as deep. I want you to go back of your clinical standpoint. Beyond the bottom of that pocket you have progressive changes far down into the tissues before a normal condition is reached. How far may these tissues return from their pathologic condition back to their normal type of construction? Mind you, I have not said that there is not possibility of reattachment to the surface of the cementum, and I am not going to say so. Personally, I believe there is, but I would not dare say so. There must be a good deal of work done on that matter before anybody can come to a conclusion on it, and in the picture I am going to show you will see some of the reasons why we have to be very guarded in our ideas and statements.

First, I want to explain the material. The first material was taken from specimens gotten for me by Dr. Black a number of years ago. Perhaps, in the discussion he will give you the history of that piece of tissue. It was from an upper central incisor which had been under his personal observation for a number of years, and being the last tooth left in the mouth, instead of being extracted, it was removed, bone, gum tissue and all, and then was sectioned. That was the first piece of human material studied in this country and the microscopic structure of the tissues reported.

The rest of the material has been gathered from a series of 22 or 24 autopsies in one of the hospitals in Chicago, taken more or less at random from the material we could get, showing all grades from some of the tissues that were practically normal to the most tremendous accumulations of pus around the teeth you could imagine. In some, the tissues have badly gone to pieces; there was nothing to see in the tissues from a microscopic standpoint. Twenty-two of these cases, with what history we could get, were sectioned and examined. You can take any two of these slides and compare one with another, so that it has been difficult to arrange the slides in a consecutive fashion so as to follow out any definite things. I have tried to arrange them generally with reference to these topics—the condition of the epithelium, the condition of the soft tissues underlying the epithelium, the reaction in the alveolar process and periodontal membrane, and the manner of progress of the pathologic changes in the tissues from their origin

in the infection of the gingival space down into the deeper tissue. I think we probably would do best if we follow the slides. One of the greatest considerations in the material has been the extent to which the cementum is concerned in the pathology presented. There are a number of things in the reactions of the cementum for which I have no explanation to offer. These conditions occur deep in the tissue away beyond the point of detachment of the tissues and far in the front rank of the attacking infection.

THE RELATION OF THE DENTAL PROFESSION TO THE
HEALTH OF THE PUBLIC AND THE INSTRUCTION
FOR MAINTAINING MOUTH HYGIENE THAT
THE PATIENTS SHOULD RECEIVE FROM
THE DENTIST.*

"The writer would like to obtain the co-operation of those who are trying to work out a plan which would interest as well as instruct the school children in the subject of mouth health and would be glad to hear from those who are working along these lines."

BY ARTHUR E. PECK, M. D., D. D. S., MINNEAPOLIS, MINN.

This paper does not deal with the theoretical side of the subjects I shall speak about. I have tried to make it as practical as possible, believing that the busy dentist who leaves his office to listen to a paper on so important a subject as mouth health should get something which he can carry back with him to help those who come under his care.

This subject of mouth health and its relation to the general health of the public is of much greater moment than many of us realize and we, the members of the dental profession, have a definite responsibility for the health of the public. Infected areas and an unhygienic condition of the mouth may be the cause of many cases of infected antrums, tonsilitis, ulcers of the stomach, kidney troubles, acute and chronic indigestion, heart lesions, rheumatism, neuritis, and joint troubles. These and many other serious conditions, are often a direct result of mouth infection, the correction of which should come from the dental profession.

We should be the logical source of information for the public

*Read before the Annual Meeting of the First District Dental Society of South Dakota, October 12, 1917.

to come to for the necessary advice and professional assistance in placing their mouths in a healthy condition. Our responsibility does not end when this is done as all of our patients should be taught how to maintain a sanitary condition. Constructive work of this kind would eventually give to the public the benefit of preventive medicine which is the course we must pursue to give to our patients and the public the greatest benefit from our services.

But little can be accomplished in getting this message to the public without the co-operation of our patients. To obtain this you must explain clearly to them the direct connection between mouth health and their general health. Give them sufficient illustrations to impress them with its importance before beginning their case.

When this has been done make a careful examination of the patient's mouth to find all of the conditions which could have a bearing on their health. This record should be made on an examination blank and to make clear how this examination should be made, let us divide these conditions into three classes according to their health value.

Apical Abscesses,

Pyorrhea,

Infectious Areas Around the Teeth.

Your examination should begin by locating on your chart each pulpless tooth and those suspected of being pulpless. Each tooth that is affected with pyorrhea should be recorded and, if the disease has progressed to either the second or third stage, it should be noted opposite the tooth. All cavities found in the teeth and all defective occlusions should be shown and the restoration required should be clearly marked on this record.

It can then be used to check up all of your work. When this record is carefully made you are ready to have the radiographs taken and begin your work.

Apical abscesses are the most serious menace to health as the patients are not always aware of their presence until clinical symptoms are evident. The radiographs should show these abscesses. There are four accepted methods for their treatment.

Direct medicinal application,

Apicoectomy,

Ionization,

And the removal of the tooth.

Each of these treatments have their place, and their efficiency depends on the personal equation of the operator.

The results of pyorrhea are next in importance to the health of our patients and every dentist should be able to recognize it in its different stages. It is estimated that 70 per cent of the people are affected with pyorrhea, and many of our best authorities believe that it is the cause of more teeth being lost than any other one disease in the mouth. There is no one condition which comes under the supervision of the dental profession in which so little effective results are given to our patients as in the treatment of pyorrhea.

As previously stated pyorrhea comes second in importance in the maintenance of mouth health and its final effect on the health of the patient should be considered much more seriously than it is. The absorption of pus and infectious matter that gathers in the pockets around the teeth is gradually but surely taken into the system, largely through the digestive tract, and the result of this is often of a very serious nature.

The part that seems unfortunate for the public and casts a slight on many of us in the dental profession is the fact that too few of us recognize pyorrhea in its first stage. We call it simple gingivitis and attribute its cause to some local irritant and give it no further attention, but if we were careful in our diagnosis I believe that many of these cases would be found to be the start of pyorrhea and that is the stage in which we should recognize it and save our patients the pain, suffering and serious results of the disease in its later stages. In the treatment of this disease one thing should be remembered. There was never a case of pyorrhea cured by medicinal treatment alone, while many cases have been cured by instrumentation alone. But this is not the only treatment necessary for all of the cases.

One must correct the occlusion to eliminate all lateral stress on the teeth affected. If they are loose it may be necessary to support the teeth with inlay splints or bridge work. Then a continuous supervision of the case is necessary which, means that they should be called as often as you think they need attention for prophylaxis or other treatment.

The field of dentistry is entirely too large for any one man to effectively cover all of its subjects and I notice the bigger men

in our profession are arriving at the same conclusion that the general practitioner in medicine arrived at years ago. When cases present themselves that should come under the head of a specialist, they do not hesitate to refer them to those who can give the necessary treatment, thus avoiding many serious results which might come from pyorrhea, if allowed to progress to the second and third stages.

The next important health problem for us to consider is infectious areas around the teeth, which include irregular teeth, cavities, crowns and bridgework which retain particles of food and irritate the gums,—in fact any condition about the crowns of the teeth that cannot be kept perfectly clean by the patients after they have been carefully instructed in the technique of using the tooth brush. It is needless for me to offer any suggestions for the correcting of these conditions as the principles of restoration are so well established.

Mouth health and its bearing on preventive medicine from the dental viewpoint is of tremendous importance to the public, as the recent investigations in medicine show that many serious diseases have the origin in the mouth and that these diseases can be controlled (cured or prevented), by the removal of the causes.

Preventive medicine, by removing the causes of disease, is more effective in promoting the public health than is merely curative medicine, which treats disease after it has gained a foothold.

Preventive medicine and the enforcement of hygienic conditions have made a health resort out of two of the most unhealthy countries in the world—Cuba and the Panama Canal Zone.

Preventive medicine has demonstrated its efficiency in checking the ravages of the bubonic plague.

Wherever preventive medicine has been applied its results have proved a blessing to humanity.

The fundamental importance of health is obvious to everyone, but few of us fully appreciate it until we begin to lose it. It is the greatest asset of the human race. It makes possible the greatest events in the history of the world. If preventive medicine gives to the people better health, and the medical and dental profession have proved that a diseased mouth is the direct cause of many serious diseases to other parts of the body, then the burden of re-

sponsibility for a healthy condition of this field of operation lies almost entirely with the dental profession.

A medical report from the Battle Creek Sanitarium says that 90% of the people who come there for treatment of digestive derangements owe their condition directly to some lack of attention to the mouth. The late Professor Miller of Berlin said that 40 per cent of tuberculosis have centers of development in decayed teeth, the tubercular germs finding a culture ground in the cavities where they develop in great numbers and finally get into the system by absorption.

He believed that people with pyorrhea and decayed teeth were more susceptible to infectious diseases than others. He reported having found during the last two years of his life no less than 15 or 16 fatal cases of blood poisoning in which the initial infection was caused from abscessed teeth.

Germs multiply rapidly in the mouth because it is an ideal incubator. Ninety-two per cent of all the germs that enter our body pass through the mouth, therefore a clean mouth is essential to health.

The small particles of food left in cavities and between the teeth or under the edge of the gums, combined with the moisture of the mouth and the right temperature, make an ideal place for the growth of germ life. As high as two million germs have been found in one mouth.

It is not so much the kind of germs, as the quantity, that breaks down our physical resistance to disease. Therefore we should be extremely careful that our mouths are kept in a healthy condition. The absorption of pus from blind abscesses at the ends of the roots or an advanced case of pyorrhea, which produces pus, is a serious menace to health.

Badly decayed teeth, which hold disintegrated food and infectious matter, make it possible to carry into the stomach with each mouthful of food some of this infectious matter which dilutes and poisons the digestive fluids until their efficiency has been reduced from 90 per cent to so low a point that the body may be deprived of its normal amount of nutrition. This would lower the resistance to disease and might be the cause of a serious illness.

The importance of a clean mouth to the invalid should be carefully considered. The patient's lowered resistance to disease offers

many more opportunities for serious results from the absorption of ptomaines than in health. This lack of mouth hygiene is often the cause of a relapse or even more serious results with many patients who seemed well on the road to recovery.

A strong illustration of the far reaching results of the presence of infectious matter in the mouth was called to my attention while in San Francisco. A gentleman had been treated for three weeks by a physician for a rash which suddenly appeared all over his body. Finally one of his teeth began to bother him and an examination showed a badly abscessed tooth, which was removed. In less than four days the rash had entirely disappeared, showing the direct connection between mouth health and the general health.

Dr. Konzett of Dubuque cited a case before our Minnesota State Meeting which illustrates the importance of mouth health. He was called in consultation by a physician over the case of a lady who was so seriously ill at the hospital that the physician had little hope of her recovery. She was so weak she could scarcely move her head and nearly as white as the pillow on which her head was lying. Her illness was undoubtedly of a very serious nature.

An examination of her mouth showed a very bad case of pyorrhea. Pus could be squeezed from the gums opposite every tooth she had in her mouth. The consultation resulted in a decision to remove all of her teeth but the physician doubted if she would live through the anesthetic. However, it being the only alternative, she was anesthetized and the teeth removed. Three weeks after the operation the patient walked into Dr. Konzett's office to thank him for saving her life.

A startling illustration of the importance of mouth health to the general health was given in a London Medical Journal. It cited nine cases of insanity which were caused through unhygienic conditions of the mouth. These cases were treated for pyorrhea and each tooth put in as nearly a healthy condition as possible and just before this article was written, six of the patients had been discharged as cured and the other three were nearly ready to be dismissed.

Patients should know the danger of buying a tooth brush found open on the counter instead of a brush that is sealed. The customer preceding the patient may have picked up the brush he buys and rubbed his finger or thumb, which may have been covered with in-

fectious matter, over the bristles leaving enough germs to infect his whole system providing the gums are injured while using the brush.

Some of the best men in our profession believe that a large percentage of pyorrhea is caused by constant irritation and infection of the gums with the ends of the bristles.

Injuries from an infected tooth brush may develop serious physical complication in other parts of the body and the cause may never be traced to the mouth. We would hesitate to rub our finger over a rough surface covered with infectious matter until it bled. If we did we would immediately cleanse and sterilize our finger to avoid infection; but many brush their gums until they bleed with a tooth brush covered with infectious matter without the slightest realization of the serious results that may follow.

A culture can be made from nearly every bristle of a brush that has been used for a few days. As high as three million germs have been found on one tooth brush which demonstrates the possibilities of infection if the gums are injured with the average tooth brush. One uses a tooth brush whose bristles are covered with infectious matter without considering the danger or filth which is on it, but we would think it terrible if we were compelled to use a wash cloth or towel for a month or two without having them washed and boiled, yet it would be difficult to infect one's self with either.

The tooth brush, as it is used by the average person, is one of the filthiest and most dangerous things we can use. When it is used properly it is far from being either and is the best appliance the profession has given to the public for maintaining mouth hygiene. The proper use of a tooth brush will entirely eliminate the menace it has been to health and give a practical means for maintaining a hygienic condition of the mouth.

Members of one family should have each brush separated and well marked so that mistakes cannot be made. Father's brush may have tonsilitis, mother's may have pyorrhea and the Lord knows what sister's and brother's may have. The only safe way is to keep them separated and keep them clean and sterilized.

It should be the duty of the dental profession to teach the physicians and nurses as well as their patients the technique of using the tooth brush, Tongue Scraper and other appliances for maintaining mouth hygienic so they can teach the mothers how to clean their children's teeth which should begin as soon as the teeth appear and

be kept up until the children are old enough to cleanse their own teeth. It will then become a part of their every day toilet. I failed to find among 200 nurses to whom I have given this demonstration a single one who had received proper instructions for keeping the mouth clean.

You must not forget that just an explanation of how to use the brush might be clear to you but to your patients a practical demonstration is necessary. A plan I have found successful is to have them bring at their next appointment a tooth brush, tooth paste and demonstrate their correct use in their own mouths.

You can make your instruction much easier to your patients by first giving them a careful demonstration of all the movements of the brush on a typodont and in order to impress on them the importance of having a brush of the correct shape, show them one of the ordinary type for demonstration purposes. Call their attention to how close the bristles are set together making it impossible to clean the debris from between them. By placing the ends of the bristles against the labial surface of the teeth on the typodont it shows them how unnecessary it is to have such a long brush which makes it difficult to clean the lingual surfaces of the teeth without injuring the gums.

Then show them a brush that is designed to clean these surfaces which is just as important as the other surfaces and call their attention to the importance of having the bristles set so that the debris can be cleaned from between them easily.

One should remember that he removes with the brush a lot of partly digested food and infectious matter which may remain on the bristles and be a menace to his health if he injures his gums. The cleaning most brushes receive is obtained by holding them under the faucet for a second or two and then placing the brush in a glass for the dust to settle on during the day. If he would look at the brush under a magnifying glass before using it he could not put it in his mouth.

The tooth brush should be *cleaned and sterilized each time it is used*. Your patients should be instructed to have two brushes so one will always be sterilized and dry. They should use an air-tight receptacle for a sterilizer. It should contain a pad on which to place a few draps of formalin. After cleaning the teeth the brush should be rinsed and cleaned thoroughly, then placed in the steril-

izer and closed tightly. When it is time to clean the teeth again use the other clean brush. When through clean the brush thoroughly, remove the sterilized brush, rinse and place the aluminum cover on it for protection from dust. Then put in the sterilizer the brush you have just been using.

After giving these instructions, hand a mirror to your patient so he can see just how the brush should be handled to avoid injuring the gums and, with his own brush and paste, clean his teeth. Cover the ends of the bristles with the tooth paste and clean the grinding surfaces of his teeth with a backward and forward movement which will distribute the paste all over the teeth without allowing the ends of the bristles to come in contact with the gums. Then use the sides of the bristles only in cleaning the teeth, drawing it straight up from the gums to the grinding surface of the teeth so the bristles will drop between the teeth and clean as they pass through.

He should understand the importance of having a tooth paste that will dissolve that thin layer of fat which covers every one's teeth and in which the small particles of food are held instead of having to scrub it off with an abrasive.

It is often necessary to grasp the patient's hand to guide the brush in the sliding movement showing him how to avoid the rotary motion which should never be used where it brings the ends of the bristles against the gums. If this sliding movement is illustrated to the patient on the typodont before showing him in his mouth, you will find he will grasp the idea much more readily than otherwise. Teach them how to clean the proximal surfaces of the teeth.

When you are through demonstrating the correct method of using the brush, insist on his using it until you are satisfied that he understands the sliding movement. Some times it is necessary to repeat the instructions at a future appointment.

The thorough use of the brush as demonstrated will show your patients how the gums, the inside of the cheek and the roof of the mouth are cleaned as well as the teeth, removing in this way from the soft tissues the small particles of food that would gather on the teeth again. I will demonstrate these movements on the typodont when I have finished this paper.

One should then illustrate in the patient's mouth the import-

ance of the Tongue Scraper, explaining to him that the papillae of the tongue vary in depth from $1/32$ to $1/4$ of an inch. These little folds or glands of the tongue hold small particles of food and moisture during the eight hours of sleep and make an excellent culture ground for the development of germ life. In order to prevent this infectious matter from getting into the stomach to dilute and poison the digestive fluids, the cleaning of the tongue with the Tongue Scraper should receive the first attention in the morning toilet—then the brush should be used.

There were 67,000 children in one year in New York who failed to be promoted to the next higher grade, due to absence, cause from illness. A close medical and dental examination developed the fact that 26 per cent of the diseases of these children were caused through some lack of attention to the mouth. It has been estimated that the loss of each day's time to the student means a financial loss of ten dollars figuring on the average earning capacity of a high school graduate during the working years of his life. The financial loss to the world through the results of unhealthy mouths is enormous.

It should be the duty of the dental profession to instruct the teachers and nurses in the schools so they can impart this knowledge to the pupils. To plan out a method of instruction which will enable the teachers to impart this knowledge to the children, who do not appreciate the value of health, requires much more tact and good judgment than it does to give it to our patients who are old enough to realize the importance of our instructions.

Yet the children must have this information and the question for us to solve is how to get this health subject before the children so it will be received by them. I do not pretend to solve this problem but will offer a few suggestions.

An attractive health film, showing every motion in the use of the tooth brush in the mouth, would be one effective method of interesting the children. Before showing the film an instructive story lecture could be read by the teacher. This would impress the children and help the nurse in her individual work which seems to be one of the best ways to insure the correct use of the brush. A film of this character would require a good deal of time to prepare and would cost between \$500 and \$1,000.

I have been corresponding with several principals in different

parts of the country trying to get their co-operation and a detailed record of their procedure. After receiving forty or fifty of these descriptions of how they present this subject to the children a comparison could be made of the best methods to adopt for the schools and a composite text book on mouth health could be made which would be just as great a help to the teachers as a text book on any other subject they are teaching.

The importance of actively bringing the instruction for maintaining mouth health in a practical way before the schools was further impressed on me when I read the following statement in the *Journal* of the National Dental Association.

"The matter of dental work may be better appreciated when it is announced by the best of authority that 15,000,000 out of 20,000,000 school children in the United States are suffering from decayed teeth. In Kansas City, it was ascertained, 15,000 out of 17,000 had never used a tooth brush. Ninety-five per cent of school children have dental diseases of some nature. As stated by Dr. Walsh and others, dental diseases interfere with study, and in many cases are the cause of failure to pass examinations."

One good illustration of a method for bringing this information before the children was given me by Miss Warren of Des Moines, Iowa.

Before entering on the "Clean Mouth Campaign" the teachers of each grade were given a number of mouth health questions to present to their children in order to arouse their interest in the subject of mouth health.

The teachers were made acquainted with the child's health interests through their answers to these questions. They found the child is not interested in health in the abstract. His sole health concern exists in relation to his immediate present, in that health will give him increased power for present enjoyment.

They received from the question, "What does it mean to feel well," the following answers:

To be happy.

To be glad.

Not to be cross.

Not to be grouchy.

To feel comfortable all over.

The next question was, "Why do you wish to feel well and

strong?" That I may run faster than other boys—that I may have red cheeks—that I may go to school or that I may visit my friends.

"How can you become well and strong?" By going to bed early—by chewing my food well—by eating pure food.

"How can you help others to become well and strong?" By being clean at home and at school—by not coughing or sneezing in other people's faces.

When these questions were answered they were then ready to emphasize the necessity of health of the school, health of the home, health of the community and the obligations of each one to promote these health interests.

Tooth brushing is regarded as a waste of time by most youngsters and it was necessary to make a strong appeal through personal appearance. They were told there was no greater embarrassment to personal appearance than diseased teeth.

A big point was made of the fact that clean sound teeth and a pure sweet breath are a social as well as a business asset.

They also tried to impress upon the children the importance of mouth health by telling them that the cause of a poor student is often due to physical defects from unhealthy mouths that could be remedied.

The upper grade youngsters, who were old enough to appreciate the value of mouth health, were told that it is difficult for a child with a foul mouth to fix attention on his work because his entire system becomes poisoned and a rebellious stomach makes a cranky pupil who cannot learn his lessons because he is not as well as he would be if he kept his mouth clean and success in life depends entirely on your health and early education. Therefore you must use your tooth brush at least twice a day and keep all cavities in your teeth filled.

In order to impress the youngsters of the lower grades with the importance of mouth health, examples of the kind illustrated in the following verse were given which the different classes learned and recited.

"Little boy blue run brush your teeth,
Brush them on top and underneath,
If you don't brush them every day
It won't be long until they decay.
Then the dentist will have them to fill

And your father will have to pay a big bill.
So whether at work or whether at play
Don't fail to brush them every day."

These are illustrations of the efforts of one teacher to present this important health message so the children could grasp at least a part of its importance.

For the greatest improvement shown in keeping their mouths clean, a prize was given every 60 days. I am giving to a number of schools every 60 days a prize of a tooth brush, tube of tooth paste and tooth brush sterilizer. Small incentives of this kind are one of the greatest helps in keeping the minds of the children on this subject. If there are a number of children whose markings are about the same, a drawing is made by placing a piece of paper for each child in a hat having a number on only one piece. The lucky child who draws this number is always sure to try and keep his mouth clean for the next prize winning and this plan is a tremendous incentive to the rest of the children. This system in one school has raised the markings from 40 to 82 per cent in less than six months.

That all children might enter the contest on an equal footing, the Mother's Club in some cities have paid for the necessary dental work of some of the children.

In closing I would offer one suggestion. If, with each child or patient you can create a desire for a healthy mouth and make them understand the importance of mouth hygiene in relation to their general health, you will have little trouble in obtaining their hearty co-operation in any plan which you may outline for keeping their mouths in this condition.

THE PORCELAIN JACKET CROWN.*

BY D. N. LEWIS, D. D. S., LAKE FOREST, ILL.

The subject of this paper implies a study and discussion of the finest technic and the highest attainment known to the science of dentistry. It involves the very acme of technical skill and artistic execution. In the whole realm of technology, there is nothing known that requires more patient training, demands more consum-

*Read before the Dental Review Club.

mate precision, or that gives a happier result when carried step by step through unerring accuracy to completion.

Let us consider first the incentive which impels an individual to undertake and pursue a task so stupendous in its difficulties of accomplishment; and then let us study the procedure to be followed in carrying out its achievement.

Statistics compiled from recent investigation show that only one crown in four hundred is free from irritation. This is appalling to the conscientious dentist. Why? And what does it mean? It means that we who have been constructing shell crowns and banded crowns of all kinds must look for a better method. If we construct any kind of a device in the mouth which will cause irritation, and that irritation, even though mild, is continued over a long period of time, it will cause a breaking down of the tissues and a suppurative process. This is an exceedingly dangerous thing when it occurs in the mouth where pus organisms are continually ingested with food, water and air. They and their toxins are constantly invading the tonsils, stomach, intestines and lungs. This, it is believed, is a prolific source of tonsilitis, requiring tonsilectomy; gastritis, interitis, appendicitis, pneumonia and many other grave diseases.

Under the caption of "pulp conservation" we may enumerate some of the reasons for trying to retain the vitality and comfort of the pulp.

The research workers report that only a very small per cent, probably one in one thousand, of the devitalized or pulpless teeth, are retained with safety to the patient's general health. The X-ray shows that nearly all pulpless teeth harbor some sort of defective area about their apices. It is conceded by all that a root canal half filled is a dangerous thing, constantly jeopardizing the health of its possessor.

Now, let us study for a moment the histology and bacteriology of this condition.

Dr. Weston A. Price, Director of the Research Department of the N. D. A., maintains that it is the virulence and activity rather than their number of a group of organisms which signify their danger, the quality rather than the quantity. If this is true, then let us see a little further. A half filled root of average size will retain perhaps from 5,000 to 5,000,000 organic cells. A place of low-

ered resistance for the lodgment and growth of virulent organisms. If they will lodge and grow where there are 5,000,000 organic cells of lowered or no resistance, why not as well thrive and propagate where there are only five or ten cells of the same type? The one, the former, we can plainly see macroscopically and even with the X-ray, but who would expect to see the latter condition with the X-ray, if indeed it could be seen at all, even with the microscope? Yet it is the quality, not the quantity in which the danger lurks. From the small chronic, blind, apical, dento-alveolar abscesses, germs are carried through the circulation and lymph channels to every part of the body, lodging and thriving wherever they find lowered resistance or congenial environment. They are productive of such fatal maladies as arthritis, myo and endo-carditis, nephritis, arteriosclerosis, metastatic abscesses, cerebral abscess and spinal disorders. The dental profession is awakening more and more to its responsibilities in the prevention as well as the cure of disease.

"Prevention rather than cure," this is the slogan.

Hence the revival of the Porcelain Jacket Crown. It is not an innovation. It was introduced into the profession about thirty-one years ago by Dr. Land of Detroit. When made with the care and precision its meritis demand, it more perfectly represents the normal typical tooth with vital pulp and devoid of gum irritation than any other means of crown restoration. The Porcelain Jacket Crown has never been very popular because of the quintessence of care and skill required in its construction. It is, however, more popular today than ever before, even more so, than in the days when the high tide of porcelain inlay popularity was over the land.

Now let us see about its construction.

The procedure that seems most logical and is generally followed is to clean and polish the teeth, especially those adjacent to the one to be restored. Then select the shades, two or more in number, which, when properly combined, will produce a variation that is completely in harmony with the environment. This is easier said than done. One may spend much time and serious study in the selection of shades. The shade guides provided by the manufacturers of porcelain are exceedingly clumsy and inefficient. The most exasperating of all shading problems is that found in the replacement of one central. It is much simpler so far as shade is concerned, to restore two centrals than one.

Shades are influenced by manipulation of body, by fusing, by setting, and in proportion to the thickness and translucency of veneer. It may be that the process of elimination will be found most applicable in the selection of shades. Eliminate those shades that will not do, and work with those that may by a happy combination gratify the most artistic and critical eye. The subject of shading alone is big enough for a text book and cannot be dealt with in detail in one paper.

The next procedure after selecting the shade is the preparation of the tooth for the reception of the crown. First, grind away the bulk of enamel, making no attempt to produce a shoulder at the gingival; then take measurement as for any banded crown, then make a band of German silver or copper. Fit the band on tooth for contour and festoon to outline of gums. This band should be at least twelve m. m. in width and the exposed end may be closed by soldering a flat cap over it. This will make of the fitted band a cartridge-like cup. Grind the tooth to the desired shape and length with a square shoulder one m. m. in depth just beneath the free margin of gums. Oil end of root to prevent adhesion of impression, fill prepared band with modeling compound and take accurate impression of the remaining portion of tooth and shoulder. The impression of the shoulder is the important consideration here, and should be taken with the most painstaking accuracy. It should be sharp and distinct in every line and angle; and especially so of the periphery of the root. Precision is the most leniently descriptive term*admissible here. If the impression of the shoulder and periphery fails by the measurement of a micron it precludes just to that extent the possibility of a perfect restoration. If the impression of these particular parts is as it should be, the balance of the impression must inevitably be correct.

The next step is to get a good bite or impression in pink wax of all neighboring teeth, both upper and lower, in masticating occlusion. Then oil teeth and take impression in plaster. Olive oil is preferable to vaseline or any other material that will occupy a perceptible space in the impression. With the remaining portion of tooth, shoulder and periphery of root well covered and protected with cement, the patient is dismissed. The tooth should be covered with cement whether it is vital or not. The important thing is to keep the gums back from the shoulder till the crown is set.

The impressions are taken into the laboratory (the dentist's own laboratory). An amalgam die is made in the modeling compound impression; the same scrupulous care being exercised in regard to the reproduction of the shoulder and periphery of root, as was observed in taking the impression. The amalgam die, when hard and separated from impression, is placed in a plaster base for convenience in handling.

Using the same measurement wire as was obtained for copper band, cut a triangular piece of 1/1000 platinum foil about two m. m. larger than the length of the wire. This foil is held with first finger of left hand against the labial surface of the amalgam die and burnished lingually around each lateral surface of tooth, then slits are cut in each side of the foil that will point from right angles of margin to mesio- and disto-incisal angles of the die; the apical portion of foil is then folded down over incisal end of die and the lateral portions of foil brought together flatly so as to be folded into a "stove-pipe joint" on the lingual surface of the die. The foil thus made into a cone is removed from the die and the surplus trimmed away. It is replaced on die and either swaged or burnished to a perfect adaptation, the most scrupulous exactness being required always at the shoulder and cervix.

The foil is then taken from the die, and the die removed from its plaster base. It is then fitted into plaster impression, the exposed portion of die being covered with a separating media, like a thin film of wax, the cast is run up and separated, the wax bite applied and the whole mounted on articulator. After separation, the matrix is replaced and snugly adjusted to the die. The high fusing porcelain body is mixed in the desired shades to the consistency of putty. These are applied with instrument, the darker shade first at the gingival and the lighter shades overlapping till the crown is built up to desired shape and size.

If shades are properly manipulated, every degree of variation will be obtained from darkest at the gingival to the lightest at incisal. When the putty-like body is patted into place, it is dried out and carved to the typical form of the tooth which it is to represent or replace.

Every care must be exercised to leave no particle or trace of the powder or body on the foil which overlaps the neck of the

tooth. Thus prepared, it is fused, retouched and re-fused until the desired product is obtained.

The crown is then moistened with water or alcohol and the foil removed. The crown may be set with any reliable cement, but Tenacit is recommended for trial.

There are many interesting and important phases of this subject which cannot be included in one paper. These phases ramify and radiate in every direction and may appeal to you as grounds for enthusiastic discussion.

As an epitome of salient points to which one may refer as a guide in construction the following outline is offered:

1. Clean and polish teeth.
2. Take shade.
3. Grind away bulk of enamel.
4. Take measurement.
5. Make band.
6. Fit band on tooth for festoon and contour.
7. Grind shoulder one-half millimeter in depth.
8. Take impression of tooth in modeling compound.
9. Take bite in pink wax.
10. Take impression in plaster.
11. Cover root with cement.
12. Dismiss patient.
13. Make amalgam die in Modeling Compound impression.
14. Run up plaster base for die.
15. Use measurement wire.
16. Swage or burnish foil.
17. Remove foil.
18. Place die in impression.
19. Run up plaster cast.
20. Apply bite and mount on articulator.
21. Replace matrix and die.
22. Mix desired shade of high fusing body.
23. Build up crown.
24. Carve.
25. Fuse.
26. Retouch and re-fuse.
27. Moisten and remove foil.
28. Cementation.

PRESIDENT'S ADDRESS*

BY B. H. BIGELOW, D. D. S., ROCKFORD, ILL.

Fellow Members of the Northern Illinois Dental Society:

It is my privilege this year to welcome you all to this 30th annual meeting.

I wish to thank you for the honor of being chosen president and I assure you that I appreciate it. Also I wish to thank the committee who have prepared such a good program and clinics, and arranged for this place of meeting. It has taken no little time on their part and I am sure we are going to have an enjoyable meeting, for which we shall be thankful to them.

In trying to picture some of the things in the dental world that we deal with from day to day, I realize that one of the first things depends upon one's point of view. From my viewpoint oral hygiene and prophylaxis is the big gun we need with which to attack dental caries and other oral infections.

In using the term, oral prophylaxis, I do not mean just cleaning and polishing the teeth, but in its full meaning of prevention.

The art of reproducing teeth crowded out the science of prevention of caries and oral infections until Dr. Wm. Hunter aroused us to investigate the results, and now oral hygiene has come to claim first place.

Perhaps there is nothing new to be said about oral hygiene and prophylaxis, but it is so important a subject that it may be helpful to consider some phase of it again.

Dr. J. S. Wallace of London states that "Dental caries is one of the most easily, and certainly preventable diseases, and there would seem now to be no valid excuse for bringing up children with decayed teeth, together with all the pathological results which they give rise to."

His belief is that the principles of dietetics suggested by a study of the food in relation to the teeth will triumph over caries. Our Dr. Harvey W. Wiley in his lecture at the Forsyth Infirmary gave us some good ideas about food and teeth. He reminded us that we are living on luxuries, not necessities, and in our "patent foods" there is too much *brand* on the box and too little *bran* in the box.

*Read before the Northern Illinois Dental Society, October, 1917.

No doubt such men are on the right path but it is about as hard to get a person to eat for efficiency as it is to get a young lady to dress for comfort rather than style.

For this generation at least we, as dentists, still need to be teachers and instruct our patients how to keep their mouth clean, and that a good tooth brush is more important than the tooth paste.

Dr. G. V. Black has devoted a number of pages in his book on "Special Dental Pathology" to the tooth brush and its use. He states the brush is of more importance than all else in cleaning the mouth. It would be well if we would re-read it and impart the knowledge to our patients.

What a great blessing it would have been if every soldier could have been taught some of the simple truths about the importance of oral hygiene and had his mouth put in hygienic condition before he entered the army.

As dental surgeons we are finding more reasons each year for the necessity of being surgically clean. Although everything used in the dental office about the mouth may not be surgically clean, they can be neat and clean, as you expect the silverware, etc., to be when you sit down to a meal.

You give your patient a sanitary drinking cup or glass neatly cleaned to use, but has the hand-piece and the right angle which you put into the mouth been cleaned since it was used in the other patient's mouth?

Dental salesmen will tell you that there is still a good demand for wire brush wheels to be used on the head of the dental engine for "cleaning" burs, etc. It would look as if we might be spreading infection from mouth to mouth by such methods.

Along these lines I believe the majority of us are neglectful, but as oral surgeons we should be leaders in hygiene.

In the advertising pages of our leading dental journals we often get up-to-date ideas as well as from the other pages; but a well known drug company has been advertising by picturing the use of a drug they are marketing as if it were a cleanly thing to carry the pliers from the mouth into a medicine bottle.

Everything else in the picture looks so very immaculate it would teach a good lesson, but that is not sanitary to say the least.

If our instruments have been sterilized how about the bracket-table on which they are laid when at work, especially pyorrhea instruments. The way pyorrhea instruments are commonly used

about pus pockets and then into healthy tissue, is it not probable that we do more harm than good in some cases?

The methods now advocated for root canal work are that everything should be surgically clean, and these methods should be followed in other operations, especially when we go into the soft tissue of the mouth.

Let us hope that one of the many good things that will come from the war is that the army dental surgeons will standardize many methods of procedure and operations which we can follow.

The molten metal sterilizer is a very clever idea, and if it will really sterilize as quickly as its inventor claims, it will prove indispensable.

Some may say it takes too much time to be particular about all these things, and our fees are not large enough in accordance with the extra time. The public is now demanding sanitary conditions in all lines, and I believe is willing to pay for what it receives.

I cannot agree with our "Brother Bill" that we should consider ourself or our family first when we are rendering service to our patients. What right have we as a profession to ask the public to put confidence in us if we betray that confidence for selfishness? What if our soldiers took that attitude when the battle was drawing near. Who would protect our flag?

A CASE IN PRACTICE

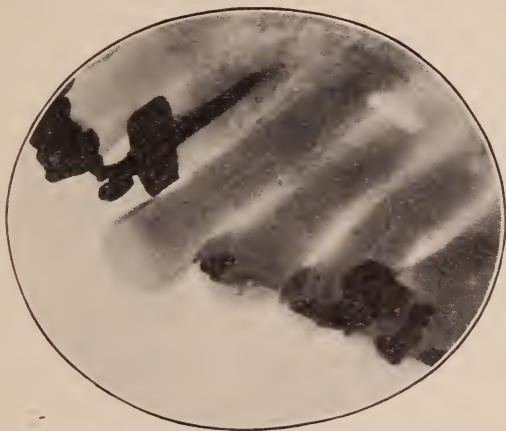
BY EDMUND NOYES, D. D. S., CHICAGO, ILL.

This case is interesting chiefly on account of its history subsequent to the first operation.

In the autumn of 1868 a young man came to Chicago from Waterloo, Iowa, to enter Rush Medical College (which was then on the north side on Indiana street, now Grand avenue). He brought a letter of introduction from Dr. A. M. Mason, a dentist in Waterloo, whom I had met at a dental meeting in Iowa while a student of dentistry in the office of Dr. E. L. Clarke in Dubuque. Dr. Mason had been treating an abscess at the apex of the right upper lateral incisor. My memory of the case is more distinct than usual because it occurred early in my practice and was rather unusual in behavior. There was a blind abscess, no opening through the

gum. A nerve instrument would readily pass an eighth of an inch or more beyond the apex.

The flow of pus soon ceased; perhaps it had ceased when he came to me, but there was a persistent discharge of fluid more translucent than pus (there may have been some pus in it. I cannot say.) This discharge did not cease after several weeks of



treatment but there was no pain and no swelling while tightly sealed with a dressing in the pulp canal. The dressings were probably iodine and creosote. Dr. W. H. Atkinson's "Big nigger" was in common use by the profession at that time.

After several weeks of treatment without effecting any considerable change, either in the character or amount of discharge, I filled the root and soon afterward made a corner restoration of gold. No trouble developed at the time. My record says the gold filling was made Dec. 15, 1868.

The young man completed his studies at Rush and practiced in Chicago for many years and removed to Waterloo, Iowa. About a year ago I had one of his sons and a daughter in my care and inquired about this particular tooth. They said their father had very recently removed to Colorado Springs and I wrote to him asking for the history of this tooth.

The following is the important part of his reply:

"Colorado Springs, December 1st, 1916.

Dear Doctor Noyes:

I went from Waterloo, Iowa, to Chicago in 1868. I had a letter of introduction to you from Dr. A. M. Mason, who had begun work on the tooth you refer to. You began work on it, prob-

ably in October or November, 1868. You did a very satisfactory piece of work and the tooth gave me no trouble until in the late 90s, after I had returned to Waterloo. Perhaps I had no trouble with the tooth until about 1905, I don't remember exactly. After that time I had an occasional "gum boil," but not pain to speak of. About six years ago I bit on something hard and broke off the gold filling.

Dr. Hough of Waterloo advised crowning as the tooth substance was so poor, and put on a porcelain crown which has given me no trouble since."

I asked him to have an X-ray made for me, but did not get any until lately. The one reproduced for the DENTAL REVIEW was taken October 15, 1917. It does not show any positive indication of apical disease. The presumption seems very strong that there was none after the first treatment and filling for thirty years, more or less, and that the abscess that caused the occasional "gum boils" got well after the crowning of the tooth.

The case is interesting as indicating that we may hope for at least occasional successes in the treatment of rather serious apical abscesses.

SUCCESS IN DENTISTRY*

BY L. M. HENDRICKS.

It is with a feeling of great anticipation that each one experiences when the end of his college days are near. Then the future confronts him and the problem of life becomes a reality. So far we have been preparing ourselves for life and right living. We have pursued the paths of knowledge and have become skilled in our work. All through these years, since first we entered as freshmen, we have been looking forward to the day when we could lay aside our notes and fears, and look forward to what lies beyond.

Where is the youth who has not indulged in dreams of the goddess of fortune paving the way to future success! Who has not seen himself already installed in a well-equipped, modern office, and an elaborately furnished waiting room, including several deep, heavy, leather rockers, each one holding a patient in waiting! In other words, each of us constantly hopes and prays that he may become a successful practitioner and a credit to the profession.

*Essay read in the Senior Conference Course in Theory and Practice, College of Dentistry, University of Minnesota.

In considering the requirements that make for success, we must first define success, or have in mind a standard of success by which to go. Some would contend that to be successful one must live for his ideal and be satisfied with nothing less; in other words, he must be an idealist. Others will claim that to be successful one must be practical. Each of these courses would again depend upon the ideals in mind and upon what might be called practical. I believe, however, that success, like health and happiness, and all other good things, lies in the mean and not in the extreme.

One, of course, must have ideals, but while his head is in the clouds he must not forget to keep his feet on solid ground; that is, though we may have visions, and strive for a high, noble purpose, we must not forget that things about us are not ideal, and that they must be dealt with as they are. It is better to fall short of our ideal than to fail utterly.

Glowing accounts of the wondrous success of some one person, or some specialist are of little value to the average ordinary dentist. What each one of us wants to know is "What has the average, serious, earnest, hard-working man accomplished? What kind of a home has he built for his family? How much money has he saved? What are his living conditions?" Man's greatest problem, the first and the most important, of all people and all places, has always been and will continue to be his food supply and shelter, how to obtain the necessities of life, then the luxuries and pleasures, for some degree of luxury and pleasure is absolutely essential to all of us.

Much is written these days in our journals about the ethical side and the business side of dentistry—the truth is that you cannot separate them, they are one and the same; a successful dentist is not only one who makes money, but one who in addition to making money and putting it to good use, also gives value received for same—who serves honestly and well his community in which he lives. He is one who evolves and grows as he works, and with his shoulder to the wheel ever pushing forward and upward, endeavoring to free man from the shackles of superstition, selfishness and ignorance.

Honorable methods and straight-forward, square dealing are in life so essential as in the practice of dentistry. No other man needs the protection, the influence, the practice building power, that rests solely under the sign of an upright, manly, give-and-take

character, the lack of which, were all the facts known, would explain the reason for many a failure.

The statement is made that two-thirds of the dental profession are poor men. There may be many and various reasons for this, but there is one in particular upon which I shall mention. Horace Greely said, "The darkest hour in any man's career is that in which he fancies there is an easier way of getting a dollar than by squarely earning it." It is so easy to slip one over on the patient, to give poor work, taking just half the time necessary, and soaking the patient for a man sized job. I do not think it is because they are after the almighty dollar. The nature of the work of the dentist is such that he can easily put one over on the patient, who probably thinks that he is getting first class work. Another problem some dentists have to deal with is competition. In some cases he is afraid to charge a full fee for his work. Consequently the service rendered is poor and the same work often repeated without extra fee. It is also true that within certain limits, the class of work done depends on the fee to be received. One should not be afraid to charge a reasonable fee after doing your best for the patient. The patient will soon forget the cost of the work, but a good inlay or crown will ever make her more and more grateful to you. And as the years go by and the patient comes back at intervals and when you see that the structure you have built gives service, you will be abundantly repaid in the feeling of satisfaction that is experienced as a result of knowing that you have done the work well, and so helped mankind in your own best way.

I believe the thing that counts, that which is the cause to the effect of success is the realization that "we build the ladder by which we rise, from the lowly earth to the vaulted skies," and so realizing persistently day by day, put into every operation the best thought and skill there is in us. If this be our motive thought which animate us, we will have no time to knock the other fellow. The only use for the hammer in dentistry anyway, is to mallet gold, and he who tries to use it otherwise will find it a boomerang that hits him last and hardest. And so as the years go on, it will be demonstrated to us that according as we hew true to the line of professional conduct will be our value to ourselves and community, and that our rewards will be pretty nearly in exact ratio to the service we render. In order to win you must serve. In

order to help yourself, you must help others. Elbert Hubbard has well said, "The only good we can keep, is the good we give away."

There are several factors to be considered and a few practical hints that will not be out of place concerning the winning of success. We will take it for granted that in the first place, to be successful one must know his business, he should know it from beginning to end. Also he should have a clean, restful, modern, and well equipped office, and it should always be kept that way.

Next in order comes efficiency. This subject has such a wide range and includes so much that only a few points can be mentioned. Taking efficient care of our bodies, that is preserving our health, becomes a vital factor. Health is the one big essential, for without it nothing seems worth while. We are constantly, day after day, year after year, laboring under conditions which are conducive to ill health and mis-shapen bodies. The important question is, how are we going to improve the situation, that we can go through years of practice and show but few of the scars of battle. Another question—if we don't heed the warnings of an ill cared for body,—how long are we to last at our chosen profession before we, too, have to give like many who have gone before, long before they reached their prime in life and never achieving success. One can grow old practicing dentistry by exercising ordinary care concerning our bodies and minds. By this I mean, that one will grow old in years only, though the spirit still be youthful. It is the big secret to keep yourself from growing old as the years pile up.

We cannot be too careful about the selection of our food and the quantity of it. We need to eat what is absolutely best for us, more than the other men who have less delicate tasks. It is important to remember that our minds will be clouded and our action sluggish, only as we misuse our appetites. We need the highest type of efficiency and each stroke of the chisel should count; every bit of brain energy should be ready to solve any problem or emergency that may arise in our daily practice.

Closely related to our diet is exercise. Our bodies need recreation after long hours of working over a chair. We can choose any of the outdoor sports, never an indoor one, and daily indulge in it with profit. There is no more desirable recreation than an hour of tennis each day, during the favorable part of the year. It is an excellent, active, outdoor sport, which calls into play all the muscles of your body, keeping them toned up, firm, and healthy, thus help-

ing to keep your carriage erect. In other words, it will make it so much easier for you to keep your neck against the collar. Considering the advantages gained from this ideal sport, I should deem it an investment to fix up a court on a nearby vacant lot, and the maintenance of it an investment in health and happiness.

Every man ought to have a hobby of some kind or other, one which demands a certain amount of physical work, so that when he gets through for the day, there will be something interesting for him to do, something which he can talk and think about with pleasure. The business of the following day will go more smoothly, more successfully, if it is forgotten for a while. When a man is tired, there is no sense in keeping his head bent over his work. It is the old difficulty of the bow that is never unbent.

In regard to work, do not try to crowd the day with too many appointments. As professional and ethical men, quality of our work should stand out first, regardless of the time it takes.

Mere quantity is the measure of success for the man who shovels coal or digs in a ditch. Even the best of us have a considerable amount of back work to do; but as we go up the scale of human activity quality counts more and more. The conditions of life when one can do work of the highest quality, demanding imagination, insight, vision, and creative power are higher than the condition when merely the maximum in quantity is demanded. Gulick also states, "That the higher the quality of work, the greater the nervous cost of it, and the more highly perfected must be the machine that does it."

To be brief I shall try and sum up in a few words the essential things which I have not already mentioned. To lead a successful professional life, we must have ideals which will stimulate that desire to help a fellow creature. To do this, we must first be good citizens, thereby having direct interest in all things which will benefit or improve the social, political, or religious condition of our times. If we wish to make dentistry in reality a learned profession we must familiarize ourselves with more than science; we must familiarize ourselves, so far as we can, with art, music, and most important of all, literature. Thus we may become cultured.

In conclusion, I shall give a passage from a journal, well worth quoting: "It is the young man whom labor cannot weary, nor drudgery disgust; who confronts reverses with an unflinching front; who can neither be turned aside from his settled purpose by the world's laugh, nor its scorn, or its frown, who makes his mark."

MAKING YOUR MONEY EARN MONEY—SAFELY

A Series of Articles On the Conservation and Increase of Savings

BY GEORGE LEE M'CANDLESS, CHICAGO, ILL.

ARTICLE 1. Speculation versus Investment

[EDITOR'S NOTE: The author of this article is Mr. George Lee McCandless, son of Dr. A. W. McCandless, formerly of Chicago, now of Davenport, Iowa. Mr. McCandless is connected with the bond house of Lee, Higginson & Co., and has the most excellent facilities for obtaining information on investments of all kinds. He volunteers to the readers of the DENTAL REVIEW investment information of any nature, free of charge. He may be addressed 400 The Rookery, Chicago, Ill. His articles in the DENTAL REVIEW will run during the year, and the following outline will indicate their interesting character.]

OUTLINE

ARTICLE 1. Speculation versus Investment.

Exercise of care in lending money to outside enterprise.

Perils of "Playing the market."

Reason for existence of Stocks and Bonds.

Advantage of Bonds over Stocks.

ARTICLE 2. Investment Bonds.

Classes of enterprises issuing Bonds.

Kinds of Bonds issued.

Interest—when and how paid. Definition of par value.

Value and marketability—Listed and unlisted Bonds.

ARTICLE 3. Rules to follow in buying Bonds.

Security—Management—Nature and history of business.

Prospects of borrowers—Legislative influence.

Where to buy. Investment accounts.

Diversification—Geographical distribution.

Trading—When to buy and when to sell.

ARTICLE 4. Bonds in War Time.

U. S. Government Bonds during and after the Civil War.

Foreign Government Bonds.

U. S. Liberty Bonds.

Keeping a bond account liquid.

Advantage of buying in uncertain times. Story of the philanthropist. Opportunities of the market.

ARTICLE 5. A Discussion of Certain Bonds.

ARTICLE 6. Investing for the Account of Others.

Inherited money.

Insurance money.

ARTICLE 7. Consistent Saving and Investment.

Ways of building up an independent income from small beginnings.

Advantage of keeping in debt for an investment account.

Possibilities of increasing ordinarily normal income through trading.

ARTICLE 8. A Discussion of Certain Bonds.

ARTICLE 9. Contrast Between Bonds and Other Conservative Investments.

Mortgages—real estate—farm loans.

Federal Farm Loan Bonds.

Collateral values and convertibility into ready money.

ARTICLE 10. A Discussion of Preferred Stocks.

ARTICLES 11 and 12. GENERAL TOPICS.

Some time ago my father, who has practiced the dental profession for nearly forty years, remarked to me that he would perhaps be better off today if he had had the advantage of my advice on matters of investment at the beginning of his career. Feeling this to be true and having a desire to convey a message of value on this subject to other dentists and professional men, the writer decided to set forth his understandings of these things in a series of articles.

The question of putting hard earned money to work to the best advantage is one worthy of serious thought. This should apply particularly in the case of the professional man. The man engaged in commercial pursuits may be able to perfect an organization which can continue his business after he has reached an age when he wishes to or must retire, and in this case his retirement does not necessarily terminate the income from his business. The man who follows a profession derives an income from knowledge and skill which he cannot turn over to others during illness or upon his retirement from active practice. Furthermore, the man of this kind usually has to work hard for his money and after he has earned it it deserves his best consideration. The only way the professional man can make his surplus money make more money is to lend it to some outside enterprise. This meets with varying degrees of success according to the nature of the enterprise. Every man should satisfy himself that the degree of safety which he desires is present in the enterprise to which he is to lend his money. In doing this the professional man has many things to guard against. Particularly should he beware of those schemes which promise big profits in a short time. The "sucker" lists of promoters who have "cats and dogs" to sell usually contain the names of many doctors and

dentists. This is absolutely true. Therefore I say, beware of the scheme which promises unusual returns and beware of the man who has these schemes for sale. On the other hand, there are legitimate enterprises which possess varying degrees of safety and there are various ways of putting money into these enterprises. To be satisfied that the enterprise is right and that the manner of lending to the enterprise is consistent with your requirements you should enlist the services and advice of a banker, who has made a study of these things and in whom you have the utmost confidence. This is the consistent thing to do. You would not think highly of the mental capacity of a man with a toothache who would go to a butcher instead of a dentist.

It is natural that a man should want the greatest possible return on his money. Therefore, many are inclined to take risks to bring this about. Much is heard of the few who have made big profits in the stock market but little is told of the many who haven't. Buying or selling on margins is gambling pure and simple. But it is not even a fifty-fifty gamble. The man who buys, bets that what he buys will go higher so that he can sell it at a profit. The man who sells short bets that what he buys will go lower so that he can buy it at a cheaper price to deliver to the man to whom he has sold. The small speculator does this betting without any real knowledge as to the result for it is the big operators who make the market—or unmake it. An average man goes to his broker and gives him a hundred dollars. He calls around the next day and if he finds two hundred, he thinks he is clever. If he finds nothing, he thinks he has been cheated. So stay away from the stock market. Hunches don't count. It is the great unbeatable game. The writer once took occasion to ask a veteran Chicago Board of Trade operator if he knew any one who had beaten the game and he answered that he did not. Others have said that they would be much better off if instead of speculating with their money they had put the same money in a savings bank at 3% interest.

It is not necessary, however, to be satisfied with the 3% or 4% which savings banks can afford to pay for the use of your money. A larger return can be had with safety. If this were not so, such banks could not successfully operate in safety. The growth and success of legitimate business enterprises is necessary to the continued prosperity of the community. To provide for requirements made necessary by healthy success, business men and cor-

porations frequently find it necessary to borrow money for different periods of time. If good security can be offered and the length of time for which the money is wanted is not too great, the business man or corporation can obtain a loan at a bank. Interest is paid for the use of this money—the amount depending upon current money conditions and the nature of the security. The length of time for which banks are willing to lend money in such cases varies from a few days to six months. From time to time, big business enterprises need new money for extensions, betterments and additional working capital made necessary by increasing requirements and it may be advisable to procure this money for a considerable length of time. In this case the borrower would not ordinarily be able to get the funds from his bank. To obtain this money, the concern might decide to sell a share in the enterprise, giving the purchaser a certificate of ownership of the percentage share sold. The purchaser thereby becomes a partner in the enterprise and the return on his investment is subject to its success or failure. However, the business may be strong enough and have sufficient security to offer so that instead of taking in new partners it may borrow the money needed. It may then go to a banker or bond house which can advance the money. Such a house can do this for the reason that it has investor customers to whom it can resell the debt in divided amounts. These parts of the obligation of the borrower are usually known as bonds.

Bonds of a company differ from stock in that they are an obligation of the company and represent a debt, which must be paid if the credit of the company is to remain good, whereas stock represents part ownership. Besides, a bond is usually secured in some substantial manner to assure its payment even if the borrowing company should fail. A reputable bond house, having its good name to protect, will see to it that certain safeguards surround the bonds it is to sell and recommend. Such bonds properly safeguarded offer the most attractive form of investment consistent with safety. Such bonds are purchased by banks, insurance companies and trust funds as well as individuals. Again the question of interest depends upon the nature of the enterprise and the security which is offered, and current money rates.

Another article will discuss the different classes of enterprise which issue bonds and the various kinds of bonds which they may issue.

WISCONSIN STATE DENTAL SOCIETY, FORTY-SEVENTH ANNUAL MEETING, HELD AT JANESVILLE, JULY 10-12, 1917

DISCUSSION OF THE PAPER BY DR. R. J. WENKER ON "INFECTIVE SENSE AND RADIOGRAPHIC DIAGNOSIS."

DR. FRANCIS A. THOMPSON, Milwaukee:

This paper has brought to our minds a subject of such vital importance to the medical men that we are glad to have an opportunity to meet with you and to hear your views.

Invading as we have the dental field to such a very great extent in our search for focal infection, it has brought home to us our lack of thorough insight into the subject of medical dentistry if I may use that phrase. Medical men are commencing to view the subject with increasing interest, if not alarm, for they as a whole have not been reading mouth conditions correctly. Their diagnostic pictures of disease have overlooked this very important part of our anatomy in most cases and their viewpoint as to the importance of mouth conditions is still sadly unsettled and unsatisfactory.

As the paper we are discussing today deals so directly and beautifully with the reading and interpretation of films of teeth, I would take the liberty of making a few suggestions in that line. In the reading of X-ray plates and the use of a fluroscope it has been found valuable, that one's eyes should have become accustomed to darkness and I should believe the same holds true with films of the teeth and sinuses. If you wish to obtain the best results in your study of films, you should stay in a dark room for ten minutes and then with the proper illumination of your film you will find detail which would escape you otherwise. Take time to study your films. It also might be added to Dr. Wenker's valuable suggestions that fat people offer greater resistance to X-rays and this should be considered in timing your exposures. I should like to emphasize this fact that medical men should familiarize themselves with the pathological conditions of the teeth, and with the reading of X-ray films of the mouth. Taking it for granted that the theory of focal infection is in the main correct, and that there are localized collections of bacteria in the mouth, tonsils, nasal sinuses, lungs, intestines and so forth, of a type virulent or non-virulent to the individual, we have proved in the past that bacteria non-virulent to one indi-

vidual are virulent to another; for example, the typhoid carrier, and that measles are deadly to the Fiji Islander. We are proving that quiescent bacteria when liberated at a favorable time in the same individual again become virulent. For example, a healthy appearing woman of age about 35, was sent to the writer with the diagnosis of incipient tuberculosis. She had been examined two weeks previously and a wet spot found in the right apex. At the time the writer examined her, there seemed to him no reason why the lung should be blamed for her symptoms. She had vague headaches, a little trouble with her eyes, occasionally a little fever and was not as strong as she had been before. She was referred to Dr. Wenker's care for investigation as to any foci which might lie in the head. It was astonishing, both antra were involved and the film showed that seven or eight teeth had root abscesses. Now the point is this, that when some of the larger foci in the antra and alveolus were opened and drained, the reaction was not severe. The most violent and severe reaction occurred from one of the smaller of the apical abscesses. A newer strain of bacteria had been loosened. Previously they had been locked up tight, the body had not been forming resistance to them and when they appeared in the blood, we had temperature, high pulse and prostration. It all proves the care that should be used in the diagnosis of any condition. As these teeth and mouth conditions are so closely allied with medicine and surgery, we as medical men should be held up to the strong light of scientific investigation. We again should be asked whether we are doing our best when we fail to seek in the mouth as a routine measure for the possible cause or one of the causes of the disease we are asked to treat.

Recently in a report from one of our great western clinics, it was shown that over one-half of the cases that came there for rheumatism had trouble in their teeth or tonsils. The practice of medicine is simply to search the body for that drop of pus, whether it be in the gall bladder after typhoid, in the lung in pneumonia or tuberculosis, whether it is in the frontals after an influenza or in the alveolus, tonsils, prostrate, sinuses or anywhere in the body where we have rheumatoid condition. It is time and enough we have been sitting back in the false security of past experiences and said: "Well, that is all we can do," and in the meantime newer science has planted a mine under us. We should be alert to the

time. Let us step out in advance, try to seek out that vile drop of pus which, if not killed in its lair, is going to probe surely and successfully into our spleen, our liver, our arteries and show us its handiwork by raising our blood pressure, making us short-winded and tampering with our kidneys. It is not enough to blame the medical men for their lack of thoroughness, but how about the dentist? Has the dentist who has stirred up and then bottled up an infection in the apical region of a tooth done his duty to mankind when he allows his patient to leave his care suffering from symptoms of general infection? Is any one, medical man, dental man, osteopath, or I care not what, sensible, logical or humane when he neglects the study of any abscess, alveolar or otherwise? Are they sensible when they fail to read properly X-rays of the mouth or other portions of the body? Are they reasonable when they stay ignorant or seem to want to stay ignorant of this subject? I say NO. Let us all try to work out this problem to a sensible, sane conclusion. The dentist must become the aid of the medical man in the search for local abscesses in the alveolus and should understand the proper treatment of them.

Proper intelligent co-operation between the dentist and doctor will help in every way and serve to make us better and more capable in our work. The writer is grateful for this opportunity of giving expression of his views and asks the indulgence of his audience for the trend his discussion has taken.

DR. ROBERT BOSWORTH:

Gentlemen, it gives me great pleasure to meet with you and discuss this paper from the medical standpoint. I wish to compliment Dr. Wenker on his admirable paper. His accomplishments are so well known that he speaks with the voice of authority, and I have no doubt our methods of procedure coincide to a very great degree. There is no doubt that the last few years of dental practice have been marked by a quickening of interest in things pathological and histological and that the beginning of this era was Dr. William Hunter's attack on American dentistry. Of course, we all know that the American dentistry he had in mind was the production of the charlatans of his own country who styled themselves American dentists, but in our righteous indignation we gradually came to the realization that we had been culpable to a certain extent when Dr. Billings, Dr. Rosenow and Dr. Mayo added their

testimony, we took stock seriously and to our credit be it said that the profession as a whole has altered its methods of practice to conform with these revelations.

It is true we are accustomed to divide the profession into conservatives and radicals; but there is a third class who blow hot and cold and are conservative or radical as it affects their pocket-books. These are the ones to be severely condemned. The ones who will unhesitatingly extract good teeth one day and another will put in a bridge on shaky roots because there is money in it.

One can tempt his radicalism or his conservatism according to the patient's physical condition, and conceding the fact that the results of low grade infection may be tardy in showing up, a patient who is apparently in good health and who has manifested no symptoms of systemic involvement, may be permitted to retain teeth that under other conditions should be ruthlessly sacrificed.

The focal infection propaganda has been no less a boon to the medical profession than to the dental for it has given the physicians unable to diagnose a puzzling case a way out. "It must be the teeth for I have looked into every other possibility," and so the poor dentist is again the goat. As far as the X-ray is able to determine, all abscesses are not incurable. I say this with no hesitation because it has been Roentgenologically demonstrated time and time again. But to say which are the curable ones and which are not, is a task that I do not care to assume. In a casual way I would say that if the abscess is not of sufficiently long standing to have caused absorption of the root and consequent infiltration of the tooth substance there is a fighting chance, and even in such cases in the anterior teeth, root resection may save the tooth. Yes, Rhein says they can all be saved by iodization and to the contrary Black says they can't. Well, there is no objection to trying if your patient is strong and healthy, but if he is anemic or suffering from arditis, neuritis, endocarditis, or any of the kindred ailments undoubtedly attributable to the low grade infections by all means follow your infection sense and take no chances.

I readily agree with the doctor in all details of technical procedure. There is no doubt that our surgical interference is the safe method of curing any abscess. I do not think, however, that the last word on the pathology of such cases has been written by any means, and I hope that the time will come when given a radio-

gram without fault, we may make a definite diagnosis with no hesitation, basing our deduction on the history of many similar cases, from which actual and not hypothetical knowledge has been obtained.

ILLINOIS STATE DENTAL SOCIETY, MAY, 1917.

DISCUSSION ON THE PAPER OF DR. NOYES.

DR. ARTHUR BLACK, Chicago:

Dr. Noyes has given us the best showing of the pathological changes which occur in the investing tissues of the teeth that has yet been made by any one. No one, except a person who has endeavored to search out material of this kind, can appreciate the amount of work which these slides and their study represent. While possibly we may not have gotten from this presentation those things which many of us might look upon as the most practical things to take home with us, which would help us in treatment, nevertheless this is a part of the beginning studies of the changes which take place in these tissues which we must all understand, as a basis for rational treatment. Although the pathology of chronic alveolar abscess has not been mentioned here today, the pathology involved in the two groups of cases is very similar, and it is especially similar when we consider the possibilities of healing and reattachment of the tissue to the cementum.

When we couple with this statement the fact that these two groups of conditions are almost the only two in the mouth which are to be cited as original foci, as causes of secondary systemic conditions, then we should come to appreciate the importance of such studies.

Four or five years ago it occurred to me that it might be possible to get some sections of human tissue direct from the mouths of our patients for the study of these conditions. Previous to that time all of the sections had been those of disease which had been induced in the mouths of animals or of tissues taken from the mouths of persons who had died. As mentioned by Dr. Noyes, the first few slides were from the teeth and investing tissues which I took out some four and a half years ago.

I want to say just a word regarding that case because it helps to explain some of the things to which Dr. Noyes called attention, and it helps to explain the possibility of error in the interpretation

of slides of this kind. This was an upper central incisor; there was a deep pocket on the lingual, almost no pocket at all on the labial. We removed the tooth, patient being anesthetized, by cutting on the labial side, making two cuts through the gum parallel to the root and another connecting these across the apex, drilling holes through the process, and taking out the tooth, peridental membrane, bone, gum and all at one time. We showed in those slides of the labial side changes in the tissues far down below the line of detachment. Remember, there was a pocket on the lingual side that went nearly to the apex of the root, and we would expect in that case more changes in the deep tissues on the labial side than we would had that tooth had only a shallow pocket on the labial side. There was extension of the inflammation around the tooth from the lingual to the labial as well as slight labial extension apically. I mention that because it is a thing we must remember in the study of the relative positions of the inflammatory changes in these sections.

Since the removal of this tooth of which we have spoken, I have cut a good many sections of the soft tissues and we have extracted other teeth with the overlying tissues for purpose of study. While my personal study of these cases has not been as thorough as Dr. Noyes,' the same changes in the tissues have been observed. Dr. Noyes has not done himself full credit here in not emphasizing more forcibly his studies of the lymphatics of these tissues and of the progress of the pathologic changes along the perivascular lymphatic vessels. I am not going to recite the changes in the tissues, because Dr. Noyes has presented them better than I could. There are, however, certain features of these conditions which bear upon the possibility of healing or the impossibility of healing which I think it might be worth while to emphasize. Dr. Noyes called attention to the fact that in cases in which we have deposits of salivary calculus attached to the roots of teeth, the infection travels principally along those lymphatics outside of the bone of the alveolar process, which corresponds with the clinical picture of these conditions. Any one who has observed many cases where he has removed deposits of salivary calculus, will have noticed that if he takes a thin bladed instrument afterwards, there is, as a rule, no pocket alongside the root of the tooth. The membrane has not

been detached beyond the point to which all of the overlying tissue has been destroyed.

He showed another type of case in which there was serumal calculus under the gingiva and the inflammation had traveled between the alveolar process and the root, destroying the peridental membrane and formed a pus pocket.

We have noticed another thing clinically; that pus pockets tend to progress more rapidly towards the apices of the roots than to spread around the roots, so that a pocket grows deeper much more rapidly than it grows wider. We should remember in our histology that the blood vessels within the peridental membrane, for the most part lie parallel to the length of the root, some of them going over the edge of the alveolar process and running down towards the apex of the root, others going in about the position of the apex and coming up to meet these, so that most of the vessels run parallel to the length of the root. Dr. Noyes' observation of these changes in the blood vessels serves to explain our clinical observation. If this infection travels principally along the perivascular lymphatics, the pockets should progress principally in the direction of the length of the vessels, as we know they do. Possibly this also explains another thing which we observe clinically; that in a chronic alveolar abscess there is not a corresponding progress of destruction of the peridental membrane towards the gingiva. Why should we not have a long pocket progressing towards the gingiva corresponding to the one we have from the gingiva? Because the lymphatics do not run that way. The route of travel is from the gingiva towards the apex, and, it seems to me, that may explain the difference in the progress of the destruction of the peridental membrane in these two groups of cases.

This also explains why there is a little tissue attached to the surface of the root with the pocket deeper a little away from the root, because these vessels are about half way between the surface of the root and surface of the bone. Destruction is first through the substance of the peridental membrane, severing the fibres, and then gradually towards the root, destroying all tissue up to the cementum; likewise the fibres attached to the bone are destroyed.

In speaking of cases under treatment, Dr. Noyes spoke of the fact that when the swelling had subsided about such a tooth, meas-

urement of the pocket would show it much less deep, which did not mean that the pocket had healed up from the bottom, but that the gingiva had receded down to its normal position. In that connection I want to call attention to the fact that many of these teeth are very loose, but become much less so following a little treatment, and we are inclined to think we have done something wonderful for the tooth and that there has been a reattachment of tissue. We are inclined to think that the looseness on the one hand and tightness on the other represent a difference in the amount of peridental membrane attached to the root at the two times, which I do not believe at all. During the period of inflammation the fibers of the peridental membrane, which are normally taut, pulling upon the root in all directions, have relaxed and the tooth has unusual motion. As the inflammation subsides the fibers begin to tighten up around the root, and consequently the tooth is less loose.

We have all been impressed with the fact that the things which occur in these investing tissues represent a very complicated problem, or probably we should say, very complicated problems, because there is more than one type of progress of disease here, and doubtless more factors are concerned in it. We have often seen absorptions of cementum, and of that I wish to speak especially, because when we come right down to the last analysis in the study of these cases from the standpoint of treatment and the possibilities of healing, we must always wind up with the cementum. That is the tissue which stands in the way of healing.

There is one relationship between the cementum and the soft tissues and infection of the soft tissues in these cases which, has not been sufficiently appreciated. We have paid too much attention to the invasion of the soft tissues in considering the possibility of healing and too little to the cementum. We should look, I think, upon the invasion of the soft tissues as a very dangerous thing, so far as systemic effects are concerned, but as a matter of little consequence so far as the possibilities of healing are concerned. What happens in any one of these cases to this soft tissue which is so badly infected when the tooth is extracted? The microorganisms in that tissue are corraled and destroyed within a comparatively few hours and the tissue is well of infection. Why is it it does that so quickly following the removal of the tooth?

It is hard to get away from the belief that it is the pus soaked cementum which served to keep the infection going. It has kept the soft tissues in the condition they are in. If the soft tissues are able to destroy infection so quickly when the cementum is removed, we must study the cementum more carefully.

In closing, I want to make an analogy, if I may, to the statement which Dr. Noyes presented of the hair follicles and the finger nails, and other epithelial appendages. In each case we have a highly specialized tissue. Within the hair follicles there are highly specialized cells which form the hair, and if something happens in the follicle to destroy these specialized elements no more hair is formed from that particular follicle, therefore a fellow has a bald place on his head. We do not expect hair to grow on a bald place where the hair follicles are destroyed notwithstanding the fact that the bald headed man may buy all the hair restorers that come along. With the finger nails, if some of the cells which place where the hair follicles are destroyed, notwithstanding the form the matrix are destroyed, the nail formed thereafter will be defective in a line corresponding to the particular cells. It is a rule that in all tissues inflammatory processes destroy the specialized cells and they are replaced by ordinary tissue of the type, instead of being replaced by similar specialized elements. So we will have to consider the cementum on a denuded root of a tooth as coming mighty near being a bald head.

DR. H. A. POTTS, Chicago:

Dr. Noyes has certainly opened the door and it remains for us to go in and see what lies hidden therein. It might be worth our while to take up the subject of inflammation. You have just seen pictures which have been said to demonstrate the conditions due to inflammation. Inflammation is a reaction of the cells of the body; in fact, life itself is but a reaction or an adjustment of our internal relations to the external relations. Long ago inflammation was recognized as being this reaction, being manifested by the presence of swelling, heat, redness and pain. Now, to get this reaction there must be some causative agent. That causative agent may be physical, chemical, mechanical, electrical, or a mixture of some of those which we have later learned to term under the name of bacterial. It is not the bacteria themselves which produce these reactions, but as everything that lives throws off excreta, it

is the product of this bacterial growth that leads to this reaction manifested by these various signs which we speak of. Life itself is this continuous adjustment, is a continual decay, supported by a continual repair.

The repair of the peridental membrane, to which Dr. Noyes has referred, I think, might be classed along with the regeneration of cells of the kidney, or regeneration of cells within the liver, which we can recognize as being regenerations after destructions, but no bile capillaries have ever been demonstrated from among newly regenerated cells. The cells of the convoluted tubules of the kidney which are regenerated do not take their place along the passageway and are not active in the secretion of urine. The more highly evolved an organ is, the less reparative power it has. In the growth and repair of these pockets we have growth and repair by substitution and not normal tissues. With a low grade of irritation we see increased growth. I can scratch my finger until the skin begins to increase in thickness; I can apply red paste on the epithelium anywhere, and if I leave it for a time, the skin will have grown to resemble hair, the red color having stimulated it. That is a particularly potent low grade irritation or stimulation, and stimulation is but the lowest grade of an irritation, or, to put it this way: an irritant is an intense stimulant. So I think we must measure these pathological conditions by the degree of irritation present, the lower degrees being balanced by the resistance of the part and the time over which they are active leading to repair or proliferation. I will not say repair or regressive changes only because in this low grade or light stimulation we may have an overgrowth, and hypertrophy, and in the process of destruction, when the acute exacerbation is over we still have a low grade irritation. We may have a repair or an effort at repair by some of these tissues, and as bone and cementum have a tendency towards this reparation, we must consider this only an effort, and that it is a losing game generally. So we may, I think, in that manner account for osteosclerosis and osteoporosis, together with the complete destruction of bone in these tissues. The presence of this irritating material calls numbers of soldiers to the front. These soldiers are the white blood corpuscles. They are the ones that resent an injury, and in a case of appendicitis these white blood cells, together with the omentum, wall off the appendix from the rest of the peritoneal cavity. They are de-

posited all around the area of attack or the area of irritation. We see this in the more acute type, and in the chronic type, and that can be exemplified by the infective granulomata, tuberculosis, the third stage of syphilis, the formation of gummata. Where the irritation is of low grade and of long standing we see other types of cells, and a proliferation of the fixed cells of the part, but in these acute cases we see mostly the polymorpho-nuclear white blood cells. So I think in the study of these parts, peridental membrane and bone, we can judge of the destruction and tendency to repair by the character of the cells which invade the part. We see bone destroyed and replaced with scar tissue. We see scar tissue because of wounds, notwithstanding our division of healing simply from the standpoint of study. There is healing by granulation tissue or by scar tissue. It is not the granulation tissue that does the damage; it is the presence of infection. All wounds—in fact the finest kind of wound made with a sharp instrument dividing only one layer of cells, when brought in perfect apposition heals by granulation of tissue and you cannot tell the difference because we have the presence of the white blood cells; we have the proliferation of the fixed cells of the part. We have the proliferation of the endothelial blood vessels jumping over and bridging over them. This is just a definition of granulation tissue except we speak of an excess of granulation tissue in filling up a cavity. When that contracts it is scar tissue, or after it is repaired the blood vessels are squeezed out of it, it contracts, and it is a scar, many times to be replaced by cartilage or bone, but nevertheless the process is one and the same. The inflammatory part of this mass certainly has to be considered in the treatment of pyorrhea, and the rational treatment of anything is to get at the cause, or, at least, relieve the factors of secondary causation like the presence of calculus. That is one thing, but the primary cause lies deeper, and we must not forget the character of the tissues in which we are working and judge of the usefulness or hopelessness of the case, because if we understand the conditions that the parts are readily in at the time, we can better judge whether it is better to try and restore such a case when we think that restoration will, in all probability be a failure, or whether, after studying the pathological conditions, we decide on radical treatment from the start.

NORTHERN ILLINOIS DENTAL SOCIETY, THIRTIETH
ANNUAL MEETING, HELD AT DIXON,
OCTOBER 17-18, 1917.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

DR. B. J. CIGRAND, Batavia:

The president has given us a brief yet practical address—every sentence being like a gospel line, from which whole sermons could be drawn. Now the problem of how to reach the public mind, is in my estimation best solved by giving the laity less of this so-called “big and high sounding talk.” We have shot over their heads with our ultra-technical terminology and we wonder why they seem uninterested and indifferent to our plea. They have in truth been patient with our scientific discourse and if we wish them to become enthusiastic we must let them have the truth, by the route of simple language and in words which they can easily understand. The good, plain, academic English will be the best vehicle to transport or transfer our ideas to the public comprehension. Less of the word Prophylactic; less of this term Oral Cavity; less of this hygiene talk and more of “keep the mouth clean,” and “Have a healthy mouth” and sound, perfect teeth. These are terms they understand. The simpler, the plainer and the less complex the popular lecture or magazine article, on “Tooth Cleanliness” the more certain will be the goodness of the verbal or written exposition of the truths regarding the fact that physical and mental vigor depends largely upon perfect dental organization. But some men have an idea that they are not teaching the public, unless the discourse contains long compounded words and clauses by the yard, and these qualified by other grammatical subordinaries. Soundless picture symbols would be by far more educating to the public than incomprehensible and ambiguous technical terminology.

I well recall when, in my early practice in Chicago, how a little girl of foreign parents called to have dental relief. I seated her in the chair and after carefully examining the aching tooth said: “Well, my little girl, I think you better have the tooth extracted.” She looked up at me rather confused and added: “Doctor, my mother does not believe in extracting; she wants my tooth pulled.” (Laughter.) Yes, I, too, felt like laughing, but I in reality was her pupil,

and she my instructor. She taught me how to speak to a child whose English was still edged with the foreign tongue. A similar incident was related to me by Dr. Land of Detroit. A small boy called to see him and after examining the boy's tooth, remarked: "Well, my lad, you better have that tooth filled with oxide." The boy answered, "I will have to see my mother about that," and left. The next day he called, saying: "Doctor, my mother does not want that tooth filled with ox hide. She said you better put in cement."

So, let me emphasize that these items go to indicate that if we hope to get the adult ear of the public we must adjust ourselves to the circumstances of public illiteracy, not public ignorance, of the scientific terminology of our learned profession. It will not degrade us, as some may think, to simplify our language when addressing the public. In fact it is a mark of higher training to be able to convey our exalted or technical ideas in ordinary conversational vocabulary; but he who can do this and feel that his dignity is not entirely lost—he well serves the deserving public. The logic of this is emphatically illustrated in the life of that great commoner, Abraham Lincoln, who won the presidency because he knew how to talk to the masses; his plain, simple, correct and meaningful English went to both their hearts and minds and it was this wonderful gift of translating the technical constitutional terminology to commonplace and easily understood English which endeared him to mankind for all time.

We as a profession, if we hope to reach the masses, must take the lesson. We must brush aside **the** dignity of the degrees; we must eliminate the aristocracy of education; we must not seem above the crowd nor attempt to appear too refined, too cultured or too wise to come down and talk to them; they are a wise jury and can detect almost at sight the overbearing, aristocratic and vain professional caste-worshiper. We in this republic have neither time nor patience with aristocracy, be it in politics, religion, education and surely least of all from the professional. Today, as of old, we Americans are for the commoners, and the armies we are amassing are fighting aristocracy—the visible enemy of society, and we dentists too can be classed as soldiers as we are all engaged in fighting the invisible enemy, the bacteria, the germs and the microscopic lives which are engaged in a warfare against the higher and complex forms of life, and so we may claim a share in the great

struggle for the survival of the fittest and thus preserve human health and human liberty.

Another point which appealed to me was the reference to office and instrument cleanliness. Nearly a score of years ago it was my good fortune to spend a week in the office of that distinguished operator, Dr. McKellops of St. Louis, and while there was impressed with his technique in caring for disordered gums. He never used the same instrument from a pus pocket to other receding tissues because, he said: "I do not wish to be the cause of spreading the troubles. I wish to limit and constrict the disturbance." The truth of this is not well known in the profession. We still employ a single explorer, a single excavator and a single broach as an instrument for various other disease filled and inflamed parts, and hence distribute the trouble. Each tooth should be treated as in a separate mouth. This will require more time, but it will be a safer and more scientific procedure.

The molten metal as a disinfectant will claim more of our attention in the near future and the expense will not exceed a dime to possess the fluid metal for a period of eight hours, and this certainly is not expensive if it will keep our instruments clean and free from infinitesimal forms of life.

Lastly, permit me to direct your attention to the loss we as dentists have sustained in following the advice of some narrow-minded leaders who have instilled in our minds that we are a separate profession, distinct and far apart from the medical fraternity. This narrow gauge has kept us from sharing in profound equations of progress and naturally robbed the human family of untold comfort, to say nothing of extension of life. I have of recent years aimed to extend every cordiality to the physicians and surgeons in the hope that our profession may become more closely identified with research work. The enormous bequests, the liberal donations which have come to the medical world would have cheerfully in part fallen to our researchers and great advance would have followed in the wake. Our individual enterprises and our meager professional support does not measure up to what we deserve and if we unite with the medical profession we will all the sooner gain not only a higher scientific position, but fall heir to funds which can be used to the alleviation of pain and the elimination of many dental disorders which today baffle our investigators. We have been sailing along in

our independent canoe, often capsized, but still in the stream, but we might with diplomacy have fared better in the steamer and have occupied honorable and serviceable positions in various capacities. Hence let us strive to weld together a kindlier spirit for the kindred profession and by our behavior and our real service convince them and the world that we, too, strive for the goal of human service and have, single handed, accomplished wonders, but with their continued aid and confidence will establish the fact that medicine and surgery are handmaidens of dentistry, all engaged in that highest of labors, the preservation and conservation of human health and beauty.



THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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A WARNING.

This profession of ours has been built up by continuous and exacting effort on the part of conscientious men who have had at heart more the welfare of dentistry than any personal aggrandizement. Connected with its development are the names of many self-sacrificing and noble men, the mere mention of which would make an array well worthy the pride of any profession. We have grown to revere the names of those men, to hold them up in our minds as examples of the highest professional and ethical rectitude. They form the sweetest savor of our inherited traditions, and furnish the chief incentive for renewed effort on our part to further advance the best interests of dentistry. They have left us a heritage which is rich in hallowed associations of the formative period of a worthy calling, and we owe it to them that we maintain to the fullest extent the reputation that they have given to our profession.

Not only this, but more recently we have been furnished an added incentive to exalt our professionalism in the action of the Federal Government with respect to our status in the army, and we are under deep obligation to devote ourselves wholly and solely to the welfare of the profession, the Government and the particular people we serve. Everything points to the stern necessity of consecration on our part to the development of true and unselfish professionalism in our ranks.

But what do we see? Too frequently we are compelled to witness the worst form of commercialism entering into dentistry. It comes in various guises. Sometimes it is outspoken and brazen, which is bad enough. At other times it hides behind the skirts

of pseudo-professionalism, which is worse. A man may be a member of a dental society and yet commercialize his calling disreputably. He may impose on the people he serves to their detriment, and when he willfully does this he commits a grievous wrong. Sometimes it would almost seem as if there were as many sinners within the church as without, but of course **this is**, strictly speaking, not true. What makes it seem true is because we notice delinquencies more quickly among believers than among non-believers. The point is that there should be no delinquencies among the believers—neither should there be violators of true ethics among dental society members. To impose on a patient in any way is a violation of ethics just as surely as is a display advertisement in a newspaper. This fact should be ever in the mind of every society member, and it should govern him at all times in his treatment of patients.

In recent years the chief violation of true ethics in the profession has related for the most part to the commercialization of fads. Every new idea, flimsy or otherwise, has been paraded before the people as the cure-all for everything dental, and the public has been worked to a finish as long as the fad lasts. Go back as far as cataphoresis. A legitimate effort on the part of the profession to painlessly prepare cavities for fillings was turned to commercial purposes in the most shameless manner, and it was not till the public itself rebelled that the fad died. In 1893 a paper was read before the general session of the World's Columbian Dental Congress sagely setting forth the edict that hypnotism was to be the future reliance for performing dental operations painlessly, and a prominent editor of one of our journals contended that five years would see it the recognized practice among all progressive dentists. But it took less than five years to bury it so effectually that it has never been resurrected. The people turned their backs upon it—thus showing their good sense—and it died almost before it was out of its swaddling clothes. Then came analgesia—commercialized to the last limit. Every practitioner who did not sanction it was dubbed a "fossil," a "moss-back" or worse; and it was proclaimed from the housetops as the panacea for most of the dental ills. And dentists themselves were not the only ones who fostered this fad. Some of our supply houses entered on a propaganda of education and instruction—for commercial purpose, chiefly—showing the

profession how advantageous it was (commercially, chiefly) to introduce analgesia in their offices; and not stopping at this, they did not hesitate to discredit, and in some instances even to malign, men in dentistry who conscientiously objected to this practice. It requires courage in these days to oppose every passing fad on account of the vituperation that is heaped upon the head of the man who does it.

Then again it is not always so much the particular method of practice that is objectionable as it is the commercialization of it. Even so valuable a thing as oral prophylaxis is in danger of being brought into disrepute. Rash and unwarranted statements are constantly being made to patients in connection with this work, to the effect that the teeth will never decay or become diseased in any way if they are treated by this method once a month. There are mouths in which this may hold good, but there are others in which it emphatically will not, and the plain truth should be told to the patient.

Local anesthesia, beneficent as it is, will soon be brought under the same category unless saner methods are advocated in its use. To make a general practice of injecting the surrounding tissues for the purpose of preparing cavities in the teeth is a procedure wholly unwarranted, and even in the most extreme case of sensitiveness it is doubtful if it is justifiable.

So useful a thing as the X-ray is being commercialized, and let us go further and whisper it in secret places that the bug-bear of focal infections is not escaping the general tendency. The fears of the public are being played upon in a wholly unwarranted manner, and commercialism is running rampant, feeding upon these fears. Myriads of useful, valuable and perfectly harmless teeth have been sacrificed upon the altar of this Moloch of focal infection, and the end is not yet. Please let it be noted that this is not an argument for leaving any infected tooth in the mouth—merely that the practitioner should be certain that it is infected or cannot be cured.

If all these practices were due solely to misconception of facts there would be some justification for them. Men are not infallible in their judgment, and should not be censured too severely for mistakes. But when the canker of commercialism is plainly discernible all along the line, there should be no quarter for the offender. And the warning is that unless these methods of imposing on the people shall stop, the fair name of dentistry will be so

besmirched that a generation of men shall rise up and heap maledictions upon our heads. The precious heritage of all the years of unselfish endeavor on the part of the founders of the profession will pass for naught, and we shall revert back to the status of an offensive commercialism.

THE ILLINOIS STATE DENTAL SOCIETY.

When the National Dental Association decided to meet in Chicago in 1918, there was some talk of omitting the Illinois State meeting and merging it with the National. There was a disposition expressed that nothing should be done to detract in any way from the success of the National Association, and there were some who feared that the two meetings in the same state might in some manner conflict. But at a recent conference of the officers and ad-interim committee of the state society, together with some of the life members, it was unanimously decided to hold the Illinois meeting as usual. It was argued that much less than detract from the National, the state meeting might be used as a means of booming the National, and that the time intervening between the two meetings—nearly three months—was sufficient to properly prepare for both. Then again there was a strong sentiment on the part of the older members against omitting a meeting of a society which had held regular sessions for more than half a century. All in all, it seemed best from every point of view to hold the meeting, and everyone present pledged himself to get to work at once to make the meeting a decided success. But for that matter it would be hard to conceive of a meeting of the Illinois State Dental Society that was not a success. In this particular instance, when the sensibilities of every one are wrought up to the highest pitch, when patriotism and loyalty mean so much, it is more than ever important that the professional patriotism and loyalty of the state should muster out in full force and rally around the standard of this splendid old organization. President Hinkins and Secretary Luthringer are particularly anxious to make this a banner meeting, and the members all over the state owe it to them to back them up in it. If you are asked to write a paper, do so. If a clinic, say "Yes." If you are on a committee, take off your coat and go to work. Let us "all together." The meeting will be held at Bloomington and the dates are May 14, 15, 16, 17, 1918.

THE EDITOR'S DESK.

THE NEW YEAR.

Another cycle; another milestone; another span of time in which to do good and be kind. Today we banish hate, suppress selfishness, and look aloft at the nobler things of life. We forget the war and the awful agony of the world. We reach out toward the ideals of life—toward love, and harmony, and justice. The new year brings with it hope, courage and inborn aspirations. What matters it that tomorrow may prove our hope deferred, our courage wan, and our aspirations drooped? Nothing can rob us of the precious heritage of all the new years of the past, of the incentive to do better and live nobler. We gather resolve and take on our task with added zeal. We toss to the winds our mistakes and invent a new philosophy of life. We cannot live the old year over again, but we can live the new one better. We start afresh with the added experience of our former failures, and we are living in vain if we do not make the new year better than any one before it. Around the hallowed memory of the other years we dedicate ourselves anew to the demands of the year to come, and with faces held aloft we march along to the music of the rhythm of the spheres.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Angle Hand Piece:—Take apart at joints, apply cup grease to gearings and avoid a flood of grime.—*J. H. Kolter, Wausau, Wis.*

Periapical Infections:—Do not overlook the fact that a tooth root with its pulp canal and apical foramina offers a splendid means of carrying infection into the human system. Surgical asepsis is not a fad; it is an actual necessity.—*Elmer S. Best, Minneapolis, Minn.*

Do Not Extract So Many Teeth:—The extracting craze is having its day and the pendulum is swinging very far from the medium line. Throw out the clutch and apply the brakes at once. In other words, don't extract every tooth simply because there is a shadow at the apex on the X-ray film. With modern methods and painstaking care many of these teeth can be saved.—*W. O. Fellman, Oak Park, Ill.*

Cure for Nauseated Patients:—For these troublesome nauseated patients that you can hardly take an impression and fit a plate, camphor water as a mouth wash two or three days previous to the taking of the impression and fitting of the plate will help wonderfully. Then if you will get rough with them and say to them, "Cut that stuff out; I haven't time to fool with you," they will get angry for the time and will forget about being nauseated.—*Y. E. Whitmore, Little Rock, Ark.*

Dry Cavities Before Fitting Wax Model:—The success obtained by using gold foil for fillings is largely attributable to the fact that cavities are prepared with the rubber dam in position and the field kept dry, making easy the detection of decaying dentin and decalcified enamel. Cavities for gold inlays are pre-

pared wet. The cavity is never thoroughly dried until inlay is ready to set, and then it takes a good deal of moral courage to take chisel and hoe and do it all over. Thoroughly dry and examine cavity before wax pattern is made.—*Victor H. Fuqua, Chicago.*

A Hint About Richmond Crowns:—The blue or darkened appearance of a dental crown made with a facing backed with gold, occasioned by the oxidization of the gold caused by the heat required to solder the backing to the pins of the facing, may be obviated by backing the facing first with thin platinum plate, then add the gold plate over the platinum. The darkened appearance of the gum over the coping of the crown may be obviated by cutting away the labial side of the coping before setting the crown. The facing should be ground thin where it comes in contact with the gum and so adjusted that it will pass under the free margin of the gum.—*H. A. Cross, Chicago.*

Formaldehyde Gas from Alcohol Lamp:—To demonstrate that the “pepper odor” of heated air from the chip blower from the alcohol lamp is formaldehyde, perform the following simple experiment: Add to dilute sulfuric acid a drop of dilute solution of resorcin. You need not be exact, and a rather weak solution of both is better than stronger solutions. Heat the chip blower over the alcohol lamp in the usual manner, drawing in and expelling air while you are warming the metal, the same as you would do in drying a cavity or root canal. Now expel the contents of the chip blower into or against the sulphuric resorcin solution and watch it turn purple. Milk, meats and foods are thus tested for formaldehyde as a preservative. Formaldehyde is one of the greatest disinfectants in the world and most useful to us in the treatment of root canals. Use lots of it. Dry the canals well with alcohol and formaldehyde warm (air) gas.—*Homer Almon.*

An Effective Inhaler for Chloroform or Ether:—During years past I have had a great many physicians administer general anesthetics in my office and have noted the large quantity of anesthetic used in the average case. At the present time, when chloroform and ether are in such demand, we should conserve the

supply, and I have been able to conduct a profound anesthesia of half or three-quarters of an hour using less than two drams of chloroform. Aside from conservation, the condition of the patient is better and the ease of administration is not to be compared to ordinary methods. The apparatus is an adaptation of the nebulizer in connection with compressed air. It is attachable to an extension bracket, thus placing it at any point convenient to the patient. An ordinary $\frac{3}{8}$ -inch rubber tube conducts the vapor to a nasal inhaler, face piece or mouth tube, as desired, those having close slip-joint connections permitting quick change if needed. The inhalers may be effectively held in place by a head band constructed from a broken phonograph spring, thus leaving the hands of the anesthetist free for care of the patient. Chloroform requiring admixture of air should be used with loose-fitting inhalers, while ether demands close adaptation.—*J. T. Search, Onarga, Ill.*

MEMORANDA.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

The next annual meeting of the American Institute of Dental Teachers will be held at Hotel Schenley, Pittsburgh, Pennsylvania, January 29, 30, 31, 1918.

The meeting as usual will be devoted to dental teaching—a number of the papers will deal with situations arising from war conditions. A cordial invitation is extended to all interested in dental teaching.

ABRAM HOFFMAN, *Secretary.*

381 Linwood Avenue, Buffalo, N. Y.

STATE UNIVERSITY OF IOWA.

The dedication of the new dental building of the College of Dentistry, State University of Iowa, February 22, Alumni and College of Dentistry Clinic, February 23, 1918, Iowa City, Iowa. R. R. DeKruif, Des Moines, Iowa, Secretary Alumni Association, College of Dentistry.

HAIL TO THE CHIEF.

The following invitation explains itself. It is unique in the annals of men, and particularly so in the annals of professional men. We doff our hat to the veteran, we bow our lowest bow, and we reach out our hand with the warmest clasp. *All hail to the chief!*

"The Dental Society of Chester and Delaware Counties requests the honor of your presence at a complimentary dinner to Dr. Jesse Cope Green, in celebration of his one hundredth birthday, on Tuesday evening, the eighteenth of December, at half after six o'clock, New Century Club, West Chester, Pennsylvania."

ANNUAL CONVENTION OF THE TEXAS STATE DENTAL SOCIETY.

The thirty-eighth annual convention of the Texas State Dental Society will be held at San Antonio, Texas, the famous City of the Alamo, April 10th, 11th, and 12th, 1918. Members of other state societies are cordially invited to attend. J. G. Fife, Secretary, 736 Wilson building, Dallas, Texas.

ILLINOIS STATE DENTAL SOCIETY.

The fifty-fourth annual meeting of the Illinois State Dental Society will be held at Bloomington, Illinois, May 14-17, 1918.

J. E. HINKINS, *President*.

J. P. LUTHRINGER, *Secretary*.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS

TO EVERY AMERICAN DENTIST.

President Wilson has asked that every resource for winning the war be utilized to the very limit. The dental profession forms one of the greatest resources for making our army efficient. You are an integral part of this great source of help to your country. Will you meet this responsibility as an American citizen should? Of course you will!

HOW CAN IT BEST BE DONE?

By joining the Preparedness League of American Dentists NOW, and assisting in its great work. Ten thousand new members are needed right away. If you are already a member, we ask you to get at least five more just as soon as possible. The mouths of the men in our new National Army must be made healthy and dentally fit before they go to cantonments, and we must help to the limit of our ability.

The Preparedness League of American Dentists is a recognized agency for carrying on this work under the direction of the Surgeon General's office of the War Department, the National Dental Association and the Committee on Dentistry, sub-committee of the Council of National Defense.

There are 45,000 dentists in the United States. Six thousand belong to the league and have done the major part of the following work, July 16 to November 3, 1917: Fillings, 60,946; extractions, 35,909; cleanings, 2,233; crowns, 233; bridges, 184; plates, 165; unclassified operations, 6,891; total, 111,061. Thousands of operations not listed were performed prior to and since these dates.

If every one of the 45,000 had done his part, what a splendid showing we could have made. It is not too late to become a part of this great work for increasing the fighting power of our army. We know you are with us.

We've got to work together to win this war. Do your part by joining the league TODAY and we will give you real, properly directed work to do.

For membership, send one dollar (\$1.00), payable but once, to the Preparedness League of American Dentists, 131 Allen St., Buffalo, N. Y. Kindly enclose your business card to avoid mistakes in name and address.

J. W. BEACH, *President*.

THE TRIALS OF THE SURGEON.

The following letter was received by Dr. Truman W. Brophy, addressed to "Dr. Freeman Brothy," and it speaks loudly for itself:

"Dear Dr. Brothy:

"You have been recommended to me to cure my baby. He was born without no palate. The doctor says it is not a cleft pallet but that there is not any ruff to his mouth. Now I want him operated the worst way. When can I bring him and what is your price for the job? And do you guarante a good job? We are very pore people and we have already spent all our money on other doctors. Can you do this in a clinik—I think I would like a nurse. The boy's grandmother will come with me and I will bring the three youngest children, and we want you to meet us at the train. I have seven other children at home so I would like to have you do this right after dinner so I can get back home. My husband is not very well and it makes him nervous to look after the children so I must git back but the boys grandmother will stay with him in the room and see that he is not Imposed on. Now I want to here from you right away. The lip was sewed up when he was first born so that is alright. Plesse tell me your price.

"Very truly yours,

"Mrs. D——. J——."

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No. 2

ADMINISTRATION OF NITROUS OXID FOR DENTAL OPERATIONS.*

BY J. E. H. ATKEISSON, M.D., CHICAGO, ILL.

Anesthetist to St. Mary's of Nazareth Hospital and Alexian Brothers Hospital, Chicago.

Among the important branches of science which dentistry has helped in developing, that of anesthesia stands foremost. Dentistry was quick to grasp the advantages of cocain and its substitutes for the production of local anesthesia, and divides with medicine the honor for the development of the science and practice of anesthesia.¹

Although Priestly discovered Nitrous Oxid Gas in 1772, it remained for Horace Wells, a dentist of Hartford, Connecticut, to demonstrate to the world its use in the extracting of teeth.

History tells us that Wells was so impressed by an incident during a lecture by Gardner Q. Colton on Nitrous Oxid and other gases at Hartford, Connecticut, in December, 1844, that he requested Colton to administer the gas to him, and, while under the influence, to have a tooth extracted without pain. Upon regaining consciousness, he exclaimed, "A new era in tooth pulling!" From that time he administered gas with more or less success for extracting. Upon attempting to make a public exhibition at the Massachusetts General Hospital, the inhaler was removed, possibly too soon, and the patient gave a piercing cry. Wells was looked upon as an impostor. He being a modest, retiring man, felt the imputation deeply, and while continuing to administer the gas in private practice, never summoned sufficient courage to attempt another public clinic. Later he gave up the practice of dentistry, became unsettled in mind, and died by his own hand in 1848.

In 1867 Colton reported 20,000 successful administrations, and a year later a Joint Committee of the Odontological Society

*Read before the Chicago Dental Society, November 20, 1917.

and the Dental Hospital of London, England, reported so favorably upon the value of the gas that it has since occupied the foremost place as an anesthetic in modern dentistry.

About this time Edmond Andrews of Chicago, the father of E. Willis Andrews, published reports of a number of cases in which he had obtained a non-asphyxial form of anesthesia by combining Oxygen with Nitrous Oxid Gas, and, consequently, a safer and more satisfactory form of anesthesia.

According to Gwathmey,² the pioneer of anesthetic research work in America, experimental observations have established the fact that Nitrous Oxid, when given alone, induces asphyxia by gradual paralysis of the respiratory center. In consequence of the prolonged action of the increasingly deoxygenated or venous blood, the respirations, at first rapid and deep, become convulsive as the process of deoxygenation is continued, then slow and shallow, finally ceasing altogether. Nitrous Oxid therefore causes death by asphyxia.

With an increasing knowledge of the physiological action of the gas and with a clearer understanding of the dangers involved, the use of Nitrous Oxid alone has been practically abandoned. It is now generally employed in combination with oxygen and oxygen ether.

In recent years, thanks to Gwathmey, Teter, Flagg, Crile and many others, much progress has been made by wide experimental work in scientific anesthesia, by the more general development of capable anesthetists and by the creation of greater interest among surgeons and dentists, and further progress will come as the result of more general enlightenment on the subject of Anesthetic Pathology.

That we are coming to have much more respect than formerly to the dangers of all anesthetic agents and appreciation of the skillful administration of these agents by trained medical men and women is evidenced by the formation of many anesthetic societies in this country among whose membership are the brightest minds in the allied professions of Medicine, Dentistry and Chemistry. Yet Chicago, the medical center of the world to-day, I am sorry to say, cannot boast of a Society of Anesthetists.

Using the words of Paluel J. Flagg,³ of Roosevelt Hospital,

New York, "Gas Oxygen anesthesia is by far the most difficult anesthetic to administer. From the aspect of mere labor the method is unpopular for those who simply administer 'Dope,' but for the man who can catch the spirit of the work, for the man who is interested in the art of anesthesia, the method is fascinating. The recovery in a case of gas oxygen anesthesia properly administered is a triumph in its self."

The advantages of Nitrous Oxid anesthesia is its freedom from after effects. The patient is restored to full consciousness within a few minutes after the Gas is withdrawn. There is no irritation of the Genito-Urinary tract or the respiratory system. No degeneration of organs and blood changes are of short duration, returning to normal in 2 or 3 hours.

Casto⁴ states there is a tendency for the blood pressure to rise and the acid production of metabolism may be increased under deep anesthesia when cynosis is permitted to occur or continue; but when a sufficient supply of oxygen is provided this may be prevented.

Based upon my experience as a surgical anesthetist I have no hesitation in saying that there are very few contra-indications to the employment of Nitrous Oxid-Oxygen and Nitrous Oxid Oxygen-Ether in General or Oral Surgery.

I never administer Nitrous Oxid-Oxygen continuously to children under 5 years of age because of the small size of the respiratory passages and the increased liability to asphyxial symptoms. I have never had occasion to administer the gases to colored people, but think I would hesitate owing to the black skin. I would not be able to differentiate cynosis and their normal color.

I have successfully administered Nitrous Oxid-Oxygen to many patients with extreme Goitre, Hearts with broken compensation, emphysema and marked arterio-sclerosis, and I believe the stand taken that Gas in these cases is contra-indicated is more fear on the part of the anesthetist than actual danger to the patient.

Insufficient muscular relaxation is the chief objection made by the surgeon, in administering Nitrous Oxid and Oxygen. It is always possible to control or modify muscular tension by the addition of ether, and if there is the proper co-operation on the

part of surgeon and assistants, the amount may be so small as to produce no systematic effects, and the patient awakens at the close of operation to full consciousness as if no ether had been used.

The technique of gas administration is now so well understood that comment seems unnecessary. It should be given only by those familiar with the possible dangers incident to inexperienced administration, always remembering that technical error may at any time be responsible for the sacrifice of a human life. It is of the utmost importance to guard against cyanosis and respiratory difficulty by careful regulation of the admixture of Gas and Oxygen, especially during prolonged administration. That Gas-Oxygen anesthesia has not been more generally practiced, in spite of the many good points in its favor, is not a matter for wonder when we come to a consideration of the difficulties of its administration, the elaborate nature of the apparatus required, and the expense of the gases. There is no method which demands a higher degree of skill and a more untiring attention to minute details.

Teter⁵ refers to the difficulties and limitations of Nitrous Oxid and Oxygen and discusses the means by which they may be overcome. This includes rebreathing, the use of pre-anesthetic narcotics, warming of gases and the addition of ether. In rebreathing he found it possible to obtain a more satisfactory anesthesia with reduction in consumption of gases and no alarming symptoms or serious results.

The employment of pre-anesthetic narcotics is generally recognized inasmuch as it shortens the induction, excitement is lessened or eliminated, anesthesia and relaxation is more profound and the Hyper-Secretion of mucous in some patients so profuse and troublesome is prevented.

Gwathmey was the first to establish the fact that all anesthetics are safe when warmed, and Teter has conclusively demonstrated that warmed gases induce anesthesia more quietly and profoundly and is more readily taken up by the blood than is cold gas.

The addition of Ether to Nitrous Oxid and Oxygen produces a relaxation not obtained with the gases alone, but it also

increases the liability to vomiting and delays the return to consciousness.

Rigidity frequently cannot be abolished under Nitrous Oxid and Oxygen Anesthesia. The surgeon must either accustom himself to less perfect conditions and acquire a more delicate manipulation if he wishes to avoid inconvenient reflexes, or use a considerable amount of force to overcome them. As a rule, vomiting is not frequent if the patient has been properly prepared, and recovery is attended with very little gastric disturbance. Nausea not uncommonly occurs just before consciousness. Headache is not unusual, especially if much rebreathing has occurred.

The time has passed when anyone can say with any degree of conscience, "Oh, anyone can administer the anesthetic." I will admit that almost anyone can pour Ether or Chloroform on a mask and suffocate the patient with gas and produce narcosis. So can almost anyone cut off a leg. We must remember there is something more besides mortality and accidents in producing anesthesia—there is the patient's mental suffering previous to the operation.

The many doubts, misgivings and the fear of our patients are often caused more by the thought of the anesthetic than of the operation. A little confidence in the man behind the mask adds greatly to the comfort of the patient and the maintenance of an even anesthesia.

When we stop to consider this subject from the patient's standpoint, the question as to who shall be selected to administer the anesthetic becomes one of great importance. Let each one of you gentlemen put yourself in your patient's position and I doubt not that you would understand and appreciate more fully the cause of rapid pulse, quick breathing and anxious face. These and mental anguish are manifest on the approach of the stranger who is to destroy thought, feeling and strength by giving them something of which they know little or nothing. And, I dare say, after selecting your surgeon, your greatest concern would be in who shall administer the anesthetic.

Some of us have seen patients nearly drowned by Ether and killed by Chloroform and smothered with gas in the hands of those who knew nothing about one or the other. We have seen

Ether poured on a mask until it was dripping on the patient's face and neck, or a piece of gauze was soaked with Ether and placed tightly over the patient's face, eyes and all, with the request to breath easily.

Ninety-five per cent of the graduates in medicine to-day have had little or no actual experience in the administering of anesthetics, and but few lectures on this most important subject.

Take away the administering of anesthetics from the newest Interne, the nurse and the laymen, and place it in the hands of a well-trained, experienced man, and we will have made a great stride on a good road.

How many of you know the amount of Ether or Chloroform consumed or the condition of your patient while you are scrubbing up, or even at the conclusion of the operation? Consider this a moment, and I doubt not but that you will agree with me that the anesthetist should be as skilled in his work as the surgeon is in his.

How often does the success of an operation depend on a carefully given anesthetic and how often does the surgeon's welfare depend on the anesthetist, are two questions not given enough consideration.

The anesthetist should watch the pulse, respiration, and color of his patient instead of the steps of the operation, for the first indication of impending danger will be given by any one or all three of these indicators. His eyes and ears should be on the alert for any variation from the normal, and upon the first indication, discontinue the administration at once, seeing that the jaw is well forward and the tongue drawn out. If the patient does not respond to these, begin artificial respiration at once. When properly given, it is the most efficient means of resuscitation known. In a crisis of this kind, the man who is able to keep cool and think fast, is the one who wins out.

I believe that most all of the accidents of anesthesia can be accounted for by the anesthetist not seeing at once the first indications of danger.

I always make it a practice to allow no one to interfere with my administration. I instruct my patient to breathe through the nose and as near normally as they can possibly do under the existing excitement of a new and strange experience to them.

Never hurry your anesthetist and never instruct him to soak the patient. An injunction of that kind has caused many a man to overdose his patient and has often disturbed the equilibrium of experienced anesthetists.

Be ready to operate as soon as surgical anesthesia is produced, and never under any circumstances keep your patient waiting. It is better that you lose an hour than jeopardize your patient's life by one moment of unnecessary anestheziation.

In conclusion, I fully realize the shortcomings of this paper and know that many important things have been left unsaid, but I hope these omissions will be brought out in the discussion. I hope to see, however, in the near future, when all our surgeons have awakened to the necessity of expert administration of all anesthetics, a paid anesthetist in all our hospitals. Then, and then only, will the crowning glory of surgery be accomplished.

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INDICATIONS AND PRACTICAL APPLICATION OF LOCAL ANESTHESIA IN DENTISTRY.*

BY P. G. PUTERBAUGH, M. D., D. D. S., CHICAGO, ILL.

The subject of the alleviation of pain is one of the oldest in the history of medicine, dating from the misty ages when certain criminals who were sentenced to the lash drank decoctions of stupefying drugs in order to render the perception of its sting less acute, down through the centuries until only within the last seventy-five years has anesthesia become a reality. It is true that refrigeration by means of ice packs, ether and ethyl chlorid sprays, pressure upon nerve trunks, etc., has been employed for many years, but it was not until 1884, with the discovery of the anesthetic properties of cocain, that true local

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anesthesia, as we now understand the term, was induced. In the following year, 1885, Halstedt successfully anesthetized the mandible, using conductive anesthesia with cocain. Local and spinal anesthesia were practiced widely for a time, and, while the anesthesia left little to be desired, the occasional toxic symptoms attendant upon the cocain injections caused many operators to abandon the practice of local for nitrous oxid or ether anesthesia by inhalation.

The peculiar situation of the mouth with its intimate connection with the respiratory passages, however, renders continuous anesthesia a difficult matter by any inhalation method. Because of the unsatisfactory induction too frequently met with in attempts to administer general anesthesia for dental operations in the routine of a busy practice, the average dentist, in the past, has evaded the use of general anesthesia in all except those presenting definite and positive indications for its administration, the choice always being in favor of local anesthesia if it could be satisfactorily induced.

Because of the initial pain accompanying the insertion of the needle, because of toxic symptoms observed, because of after pain and soreness, and because of occasional sloughing of tissue and even abscess formation occurring at the site of injection, many otherwise conscientious operators have shunned the hypodermic syringe and the local anesthetic solution, thereby inflicting untold agonies that might have been avoided had they mastered the technic of our modern methods of induction. Every dentist can do better and more thorough work if he can operate painlessly, and incidentally, patients may use up their nervous energy in much more useful pursuits than that of enduring unnecessary pain incident to the excavation of sensitive cavities, the extirpation of vital pulps or the extraction of teeth.

Numerous cocain substitutes have been offered by various chemists from time to time, but after short trials all presented more or less serious objections until the discovery of novocain by Einhorn in 1905. After twelve years of extensive use in all branches of surgery, novocain to-day fills the requirements of the ideal local anesthetic. Novocain is non-toxic in the required dosage, non-irritating to tissue, stable enough to withstand sterilization by boiling, and is capable of uniting temporarily with nervous

tissue in a manner to produce an anesthesia that is absolutely satisfactory to both patient and operator.

In overcoming the disagreeable sequellæ that have too often followed the administration of local anesthetics in the past, we found that certain modifications were necessary: First, in the local anesthetic solution, and second, in the carrying of the solution to the tissues. The human body being composed of a high percentage of water makes it logical to employ that "universal solvent" as the vehicle for carrying the anesthetic agent to the tissues that we wish to influence.

Chemically, sterile distilled water presents no properties injurious to the tissues beyond that of disturbing the osmotic balance between the tissue cells and their surrounding fluids; a feature that may be readily overcome. If definitely uniform results are to be expected, the use of freshly-distilled water is essential, for the reason that deterioration takes place in distilled water upon standing. The effect of this is observable in the collection of sediment in the bottom of the container in the form of a flocculent precipitate. This decomposition may be aided by the action of light, bacterial organisms, or chemical salts entering into the composition of the glass container. The anesthetic solutions compounded from distilled water that has become stale are more irritating than those prepared from freshly-distilled water has been observed by many operators. Therefore, let us start right in the preparation of our solutions by purchasing freshly-distilled water, or what is preferable, employing one of the small inexpensive stills obtainable from any dental or surgical supply house and distilling the amount required as it is needed.

Physiologists long ago observed that the bathing of tissues in unmodified distilled water caused a swelling of the individual cells, due to the disturbed osmotic balance; the tissues containing normally a definite percentage of crystalloid material in the form of salts, chlorids of sodium, potassium and calcium. The presence of these salts caused the hypotonic distilled water to be imbibed by the tissue cells, resulting in mechanical injury to the delicate stroma and cytoplasm itself. This disturbance within the cells composing any tissue injected with a hypotonic anesthetic solution is in itself sufficient to account for much of the smarting pain, swelling and after soreness so frequently observed following the administration of certain

widely-advertised proprietary solutions. These disagreeable symptoms may be avoided by the addition of the proper amount of salts to the water, rendering the osmotic balance equal to that of the human tissues. The so-called Ringer solution fills this need satisfactorily, having the formula of—

Sodium chlorid0.6 per cent

Calcium chlorid0.4 per cent

Potassium chlorid0.2 per cent

For convenience in compounding, the ingredients in proper proportions have been incorporated in tablet form by various pharmaceutical houses, rendering the making of the Ringer solution a very simple matter. All that is necessary is to add a tablet to a measured quantity of distilled water. This solution may be injected hypodermically without pain, discoloration, edema or after-soreness, save that resulting from the introduction of the needle, because it does not disturb the osmotic balance of the cells with which it comes in contact and is positively non-irritating when freshly prepared.

Novocain, a white crystalline powder, synthetically prepared, is freely soluble in water in all dilutions up to equal parts. It is non-irritating, even when the pure crystals are dusted upon abraded surfaces; it is vasodilator to a very slight degree, this effect being overcome by the addition of suprarenin, and it is non-habit forming. Novocain possesses the property of combining temporarily with nervous tissue in such a manner that it causes a suspension of its power of receiving or of transmitting impulses during that period of combination, and of leaving no perceptible tissue change after its effect has been dissipated. It is rated as being seven times less toxic than cocain in the average individual, while idiosyncrasies to novocain are extremely rare. Statistics of the repeated injections of amounts of three to six ounces of a one per cent solution and from one-half to one ounce of a two per cent solution without untoward effects place the comparatively small amounts required for dental cases entirely within the limits of absolute safety.

In my work I find that the one per cent solution for infiltrative anesthesia in minor surgery, such as simple extractions, pulp extirpations, etc., and for conductive anesthesia in the upper jaw, where the nerve trunks are of small diameter, leaves nothing to be desired; but, for conductive anesthesia of the heavier mandibular nerve a two per cent solution should be used, as it will reach the central fibers of

the trunk in sufficient amount to give a complete anesthesia of the deeper structures, including the pulps of the teeth. If the one per cent solution be used here an anesthesia of the lip and soft tissues supplied by the outer fibers would ensue, but the central fibers being unaffected by the weak solution would result in a failure to anesthetize the dental pulps of the posterior teeth.

Following the isolation of the blood-pressure-raising principle of the suprarenal gland with a study of its physiologic action and the ischemia produced by its local application due to its vaso-constrictor properties, it was suggested that the combination of adrenal solutions with local anesthetic agents would tend to localize and thus intensify and prolong their effect by preventing the rapid dissipation into the systemic circulation. Clinical evidence has conclusively proven this to be true, while it also was found to possess the additional advantage of preventing toxic symptoms by retarding its absorption into the systemic circulation. Thus it has been demonstrated that cocain may be employed in one-half of one per cent solution when combined with adrenalin with results equal to a two per cent solution, in so far as the anesthesia is concerned, with much less danger from cocain poisoning.

The organic product obtained from suprarenal glands offers a somewhat unstable preparation; but in recent years a synthetic preparation of identical chemical formula has been marketed that has better keeping qualities than the organic product and being obtainable in tablet form is convenient for use.

Suprarenin, when introduced into the circulation, causes an increase in the force and frequency of the heart action, accompanied by a marked rise in blood pressure, due to a direct action upon the musculature rather than to stimulation of the central nervous system. Locally, it constricts the smaller blood vessels by direct stimulation of the circular muscle fibers in their walls. Upon injection hypodermically, this vaso-constrictor action is evidenced by an ischemic area surrounding the site of injection for a distance of one to two centimeters within from five to ten seconds and lasts from thirty to sixty minutes. After a time, the effect wearing away, the condition of vaso-dilatation ensues for several hours; probably due to exhaustion of the muscular tunics from over-stimulation. Suprarenin, if administered in an overdosage, produces the quite characteristic and distressing signs and symptoms of precordial pain, air hun-

ger, dizziness, a very full and often intermittent pulse, headache, etc. These symptoms come on suddenly, but are very transient, lasting only from three to ten minutes, and are those of an over-stimulation and increased blood pressure, but are not followed by periods of depression, such as is observed following cocain toxemias. In the two cases that I have observed no treatment was given, the symptoms soon subsiding and the operations proceed without further difficulty. These symptoms may, I believe, be averted by following the slow-injection method. Just as the point of the needle enters the tissues, expel two or three drops of solution and then wait a few seconds to allow the vaso-constrictor action to take place before continuing. The barrier formed by the ischemic ring resulting from the primary injection walls off and prevents systemic intoxication, and incidentally increases the profundity of the anesthesia by retaining the solution in the injected area.

One other requisite of local anesthetic solutions is that they be rendered sterile. Many antiseptics have been employed for this purpose, the majority of them being used with the idea of acting as preservatives of the solution. Unfortunately, the ideal anesthetic solution cannot be preserved successfully for more than a few days, and all of the preservative agents are open to criticism, inasmuch as the anesthetic solutions are less irritating if they are omitted. A freshly-prepared solution may be boiled for a short time, thus rendering it sterile, without impairing its action in the least, and is to be recommended over the chemical preservatives that have been suggested from time to time. The practice of adding cardiac, cerebral or respiratory stimulants, followed for so many years, is looked upon to-day as unwarranted and should be discouraged.

To briefly review, our anesthetic solution is now composed as follows:—Freshly distilled water as a vehicle, one to two per cent novocain as the anesthetic agent, sufficient chlorids of sodium, calcium and potassium in the form of a Ringer tablet to render the solution isotonic with the body fluids, sufficient suprarenin to localize and retain the anesthetic mixture in the locality in which the injection is made, and the solution thus compounded, sterilized by boiling.

For simplicity, all of the ingredients have been included in one tablet but these show indisputable evidence of deterioration after being kept for a few weeks so they are not to be depended upon. However, time has shown that novocain and synthetic suprarenin

may be included in the same tablet without deterioration and Ringer solution tablets may likewise be kept indefinitely. By the use of these two tablets and freshly distilled water we are enabled to prepare a solution in a few minutes that will cut short the patient's discomfort many hours when compared to the stock solutions too often employed, and the absence of after soreness and pain fully compensate for the extra effort expended.

Body cells are just as much subject to "catching cold" or of having their resistance lowered by cold as our respiratory mucosa, and the chilling of the site of injection by carrying a cold solution into the tissues is just as productive of damage as is extreme cold from any cause. This injury with consequent lowering of resistance and retarding of tissue repair may be readily avoided by the injection of warm solutions only. If the anesthetic solution be drawn into the hypodermic syringe immediately after boiling, and the injection proceeded with it will be found to be just about the body temperature by the time it reaches the tissues. This is an important item that has been overlooked too often in our local anesthetic operations.

Then too, we must reckon on the amount of force required for injection ever bearing in mind the excessive force that would traumatize and injure tissue. I have seen a number of instances in which sloughing of areas as large as a five cent piece occurred. These are seen most frequently in the hard palate and in the lower first molar region, and were traceable directly to the hydraulic pressure exerted by the forcing of an anesthetic solution therein with a heavy syringe. We must bear in mind that fixed tissue cells are bathed in lymph, and that serious damage is sure to result unless time be allowed during the injection for the lymph to escape ahead of the anesthetic solution as it is forced in; and in order to avoid mechanical injury only very light pressure should be exerted upon the piston during the injection and if 60-70 seconds are consumed in emptying the syringe the patient is thereby the gainer.

Oral mucosa like the skin, constantly harbors infectious bacterial organisms in its superficial layers. These are held in abeyance under normal conditions by the phagocytic properties of the leucocytes, but if they be carried mechanically into the deeper structures, inflammatory processes would likely ensue. This carrying of infectious material along the course of the needle has

undoubtedly been the cause of considerable after soreness, pain and delayed healing following the administration of local anesthetics and should be considered as one of the avoidable accidents.

Tincture of iodine U. S. P. 7% applied to the mucosa by means of a tightly rolled pellet of cotton and massaged well into the tissues at the point selected for the insertion of the needle will not only disinfect the site, but will render the pain of the initial puncture with the needle almost imperceptible.



Fig. 1

With a little practice any operator may so train himself to manipulate the hypodermic syringe that the pain of the insertion may be still further minimized by holding the syringe during its insertion in such a manner that no change in the grasp need be made in order to expel its contents. The best method will be found to be the balancing of the syringe with the barrel resting between the second and third fingers of the right hand, placing the first and fourth fingers above the second and third respectively with the cross bars resting between, and the thumb on the piston. (Fig. 1.) Holding the syringe in this manner permits of the injection of two or three drops of anesthetic solution just as the needle enters the mucous membrane and allows the injection to proceed while it is advanced through the tissues thus anesthetizing ahead of the needle as it is carried in.

The site selected for the primary insertion of the needle should,

when conditions permit, be at the point of reflection of the buccal or labial mucosa from the alveolar process. Mucous membrane at this point, because of its protection from irritation has a much poorer sensory nerve supply than the mucous membrane of the gingivae and by taking advantage of this we may make the needle insertion at that point with a minimum amount of pain. The submucosa here is loosely constructed, with large intercellular lymph spaces, allowing the injection of anesthetic solution with very little pressure, there being an easy interchange of anesthetic for the lymph surrounding the fixed tissue cells giving true anesthesia without such disastrous complications as tearing or traumatizing of tissue.

One of the most frequent causes of imperfect anesthesia that is met with today is that the operator after making a satisfactory injection will proceed with the operation immediately without waiting for the anesthetic agent to act upon the nerve fibers. All of the local anesthetic agents in common use require from five to eight minutes contact with nerve endings or nerve fibers in order to be absorbed and to reach the maximum anesthesia. Therefore when we allow for diffusion throughout the injected area and sufficient time for the drug to be absorbed and reach the maximum anesthesia possible, ten minutes is not too long to wait for a true anesthesia of any of the smaller nerve fibers, and from fifteen to twenty minutes are needed for larger trunks such as the mandibular and posterior dental nerves.

If anesthesia be obtained following either infiltrative or conductive injections it may be safely assumed that it is a pressure anesthesia from tissue injury produced by using too much force during the injection rather than from any action of the anesthetic agent employed, and would be obtained just as certainly if plain water had been employed instead. This condition is to be avoided because a condition of lowered resistance is produced from the injury, accompanied by after soreness and edema and is marked by delayed healing.

Local anesthesia is classified under two distinct divisions, viz.: infiltrative, the application of a local anesthetic agent to the distribution of sensory nerves thus paralyzing their endings and their power of receiving impressions, while conductive anesthesia consists of the injection of a local anesthetic solution into the region surrounding a sensory nerve trunk thus paralyzing its power of transmitting afferent impulses sent up from its area of distribution.

For many procedures the infiltrative type of anesthesia is perfectly satisfactory, for example, the removal of normal or hypertrophied gum from over erupting teeth or from proximal cavities that it has filled in, or of hypertrophied pulps the injection may be made directly into the tissue to be excised so that the point where the puncture is made is excised with the tissue thereby avoiding any after soreness from that cause as would probably occur to a slight degree if the injection be made around the area. For the removal of superficially seated roots that have little bony process supporting them the infiltration may be made by injecting to the buccal and lingual surfaces allowing sufficient time for the maximum anesthesia to ensue. For cavity preparation in the lower incisors or the ten upper anterior teeth the infiltration of 1 cc of solution over the apices of the roots will usually obtund sensation. For the extraction of lower incisor teeth infiltrative anesthesia suffices and is preferable to conductive since the latter anesthesia often affects the entire side of the face for two or three hours. For lancing abscesses where pus has localized and palpation elicits fluctuation the infiltration of the mucous membrane only, in the line of incision, using care not to allow the needle to enter the abscess cavity will render the operation painless. The maximum anesthesia here requires waiting for from three to five minutes after injecting. For the extraction of deciduous teeth the roots of which are not deeply seated, a small amount of one per cent novocain solution infiltrated about the teeth of controllable children will give perfect anesthesia unless abscess conditions be present.

Almost everyone who has seriously entered the practice of conductive anesthesia has found that with increasing experience in its use he employs it more and more to the exclusion of the commonly practiced infiltrative type. This is accounted for in the comparative painlessness of the needle insertion and the injection, the small amount of solution required, the absence of after pain and soreness, and the absolute anesthesia obtained. Patients upon whom it has been used for cavity preparation or surgical procedures are pleased with the results and request its use on subsequent occasions and that encourages one to use it with increasing frequency as time goes on. It is not recommended over, nor will it ever supplant nitrous oxid for the highly nervous, uncontrollable neurasthenic who dreads operations; for the physically exhausted individual who has

been in pain for a number of days; for the child with whom it is difficult to reason, nor for extractions in acute abscess conditions. But for the preparation of the sensitive cavity that does not respond to the ordinary methods of desensitization; for the removal of vital pulps; for root amputations; for extractions; for prolonged and complicated operations such as the removal of unerupted and impacted teeth; for maxillary sinus operations; for the reduction of fractures of the mandible and for the removal of tumors and cysts about the jaws it gives complete anesthesia. The patient can be placed in any position in the dental chair that is most convenient to the operator; there is no aspiration or swallowing of blood or mucus and no nausea, vomiting or prostration after the operation is over. In fact the anesthesia will usually last until the patient reaches home which in itself is highly desirable.

In conclusion allow me to say that we are working in a new era in local anesthesia, that he who practices it most successfully will be the man who observes to the last detail the fundamental principles that I have attempted to briefly outline tonight.

MAKING YOUR MONEY EARN MONEY—SAFELY.

BY GEORGE LEE MC CANDLESS, CHICAGO, ILL.

A SERIES OF ARTICLES ON THE CONSERVATION AND INCREASE OF SAVINGS.

ARTICLE II. INVESTMENT BONDS.

In a previous article, the writer attempted to show the advantage of purchasing Investment Bonds rather than stocks—for the purpose of making your money earn money SAFELY. It should be borne in mind that an investment bond is an obligation—a promissory note—an instrument wherein the borrower agrees to repay the principal at a certain specified time, besides a certain rate of interest while the obligation is outstanding. The reason for the existence of such obligations or bonds lies in the fact that large expenditures are necessary, from time to time, to provide for growing requirements of most enterprises. Such enterprises that are able to borrow for such purposes are better off in doing such borrowing for the reason that extensions and betterments, paid for out of borrowed funds, contrib-

ute to new earnings which will repay principal and interest on such borrowing and also add to the profits of the borrower.

Before going into the various kinds of bonds, it is well to consider the classes of enterprise which issue them. Of these there are three kinds: Public, Quasi-public and Private. The Public corporation, generally termed municipal, is operated for no gain but the public well-being. The Private corporation is operated solely for gain. The Quasi-public corporation is conducted for both these purposes. For instance, a railroad or a public utility corporation serves a public need but at the same time may be conducted by private interests. Usually, however, such a corporation as the latter is largely under public control and generally operated, subject to considerable regulation, by municipal authorities. This is only just. A municipality, having granted exclusive right for a corporation to supply a public need within its precincts, is naturally justified in seeing to it that fair rates are charged and proper service rendered.

Having been authorized by proper legislation, a municipality may finance such projects as are deemed necessary for the public good. It may be more judicious to do this financing through the issuance of bonds rather than by burdensome taxation. Such projects as building the Panama Canal or prosecuting the war should naturally be financed mainly in this manner. Likewise, smaller undertakings by smaller municipalities may be desired. A state may issue bonds to provide funds for the construction of good roads, etc., or a city may borrow to build schools, asylums, etc. Such bonds may be classified as follows: Government, State and Municipal. Of course in the broad sense, all these are municipal bonds. All such bonds are intended to be repaid by taxation—special or otherwise.

The bonds issued by private or quasi-public corporations are of an entirely different character. These must be taken care of from the earnings of the issuing corporation. The title of such bonds is generally an indication of the manner in which they are secured, how they will be paid, or in what manner special features have been incorporated.

A mortgage bond is generally secured by a lien on specified property.

A collateral bond is generally secured by certain valuable securities, deposited with a trustee.

A sinking-fund bond is one wherein the borrower agrees to set aside certain specified sums at certain specified times to reduce or retire the debt.

A refunding bond is one generally issued to provide funds for a maturing obligation.

A redeemable bond is one which may be retired at the borrower's option.

A convertible bond is usually convertible into some other form of security on some basis, which may seem to be desirable, and which will therefore invite an investor's purchase.

The title of a bond does not necessarily adequately explain the provisions of the issue. This can only be ascertained by a careful study of the whole situation covering the bond in question.

The interest, which a bond pays, usually reflects the credit standing of the borrower. Of course in a time like the present, the highest grade obligations are put out at unusually high interest rates. In normal times our government would have no difficulty in floating issues of bonds at exceedingly low rates, instead of at $3\frac{1}{2}$ and 4% as in the case of the recent Liberty Loans. Because of their general stability and security, municipal bonds bear lower rates than those usually put out by private corporations. This is also due in a measure to the freedom from taxation that such bonds enjoy. The interest on bonds is usually paid semi-annually. Unless a bond is selling at par, the interest return is different from the interest rate. For example, a 6% bond selling at 99 and due in two years yields about $6\frac{1}{2}$ % for the reason that, not only is the coupon rate 6%, but, an additional profit of $\frac{1}{2}$ point, or $\frac{1}{2}$ of 1%, per year, will be realized. The generally accepted standard of the par value of a bond is \$1000. Though smaller denominations are often obtainable, the thousand dollar bond is the most common. Therefore, when a bond is quoted at 95, it means that the price is \$950. This of course does not take accrued interest into consideration. If a bond, on which the interest is paid January 1 and July 1, is sold on February 1, the purchaser receives a bond on which six months' interest will be due in five months. It is therefore natural that the purchaser should pay one month's interest to the seller of the bond. Therefore, bonds are usually quoted at a certain price—and accrued interest.

The most common rates of interest, which bonds bear, are 5% and 6%. It is necessary for a borrower of large sums to pay a rate

of interest high enough to prove attractive to banks, which pay depositors from 2 to 4% for the use of their money, as well as private investors.

A common question, most naturally asked by an investor, is, "How about the marketability of my bond in case I should desire to convert it into cash?" The question of market is a complex one. Broadly speaking, the market of bonds is effected, just the same as dental supplies, by supply and demand. The fact that a bond is listed on the New York Stock Exchange, or any other board, does not necessarily influence the market. Some large issues of bonds have become very popular. Hence, they are usually actively traded in and fluctuate but little. Prevailing money rates influence the bond market to a greater extent than any thing else. However, if an investor buys a bond from a reputable bond house, and buys for investment, the question of market should be of second consideration. If an investor buys for temporary investment, a security suited to such a purpose can ordinarily be found. Moreover, a good bond should always have a high collateral loan value at any bank, so the question of liquidity should not be a troublesome one—provided the bond is right.

To some readers, the foregoing may seem to be very elementary reading, and to those of you, who are already bond buyers and therefore more or less acquainted with these things, I apologize. However, the object of this series of articles is, not only to better acquaint the initiated, but also to inform others to the end that they may learn the best method of properly conserving their savings.

Another article will discuss "Rules to follow in buying Bonds."

PRACTICAL SUGGESTIONS IN PLATE-WORK, FOLLOWING THE HALL SYSTEM.*

BY DR. F. J. SMITH, DOWNERS GROVE, ILL.

In coming to you to read a paper on Plate-construction incorporating the Hall System, I wish to say that any knowledge I may

*Read before the LaSalle County Dental Society, October 16th, 1917.

possess on this subject I am indebted to Dr. Campbell of Kansas City, Mo.

The technique on denture construction as taught by Dr. Campbell is simple, easily acquired, and altogether within the reach of the ordinary practitioner with a limited equipment. If the technique is followed through with ordinary care it makes plate-work a pleasure, and the results most gratifying to the dentist as well as the patient.

Feeling a desire to write something that might be of service to the average practitioner, who has not changed his methods of plate-construction in recent years, rather than go into any hair splitting details on any one phase of the subject I chose to cover, in a general way, the construction of a full upper and lower vulcanite denture, and give somewhat in detail Hall's method as near as I can without comparison with other methods.

To begin, the patient is seated with the head erect, much as one would sit in an ordinary chair. A rather oversize tray is selected; Hall's Impression Tray compound, one and one-half cakes for an upper is heated in hot water, and an impression is taken much as one would take a modeling compound impression. The impression is then chilled in cold water, when the tray may be removed from the compound without distortion. With a sharp knife trim away the buccal and labial borders. This is the tray proper. Half fill this tray with a comparatively thin mix of plaster (the setting of the plaster can be controlled by salt and warm water to suit the individual operator's methods of manipulation) place in position in the mouth, and allow the cheeks and lips to resume a position of rest. After a few moments the tray need no longer be held. Remove from the mouth when the plaster becomes hard; but do not allow it to remain till the plaster becomes too hard, or the plaster will absorb moisture from the mucous membrane making it hard to remove the impression. If the compound shows through the plaster the impression should be placed in water, so that the plaster may take up all the water of crystallization which it otherwise would absorb from the next application of plaster, mix another batch of thin plaster, dip the impression in it, place in the mouth and allow to set. Continue this way until the compound does not show through the plaster. If after four or five trials it is apparent that there are still corrections to be made, it is better to break away the plaster from the compound and start over again.

The lower impression is taken in the same way as the upper, with the exception that the plaster is mixed somewhat thicker and the patient is asked to extend the tongue, so that an accurate impression of the lingual attachments that would affect the finished denture may be taken.

TO MAKE THE CASTS.

The impressions are strengthened by setting them in plaster after which they are coated with shellac varnish, allowed to dry, then coated with sandarac varnish. As many coats of sandarac varnish are used as is necessary to make a glossy finish, allowing each coat to dry before applying the next. They are next wrapped in modeling compound, base plate wax or kindergarten clay, whichever the operator prefers, and a mix of Spence's plaster, four parts water to one of plaster, is made. While the Spence's plaster is being mixed, the impression should be soaking in water. The plaster should be dropped into the impression a little at a time while the impression is vigorously jarred. After which it should stand from six to twelve hours before separation. Casts made from Spence's plaster are very hard, and will go through vulcanization without change.

Having the casts completed, the next step is the making of the base plates. Some prefer the double vulcanization method, in which case the casts are covered with No. 40 tinfoil and over this is fitted pink wax extended to the full outline of the finished plate; a small roll of yellow wax can be added to the periphery of the pink wax and the margin of the plate finished after this first vulcanization.

Hall's method is to use a good base-plate material for the upper. One that answers the purpose very well is made by the Detroit Dental Mfg. Co.; over this a roll of pink wax is fitted to conform to the desired contour and fullness of the finished denture.

For the lower base plate a good, heavy tinfoil is fitted over the cast, and over this a low-fusing metal is melted on with a spatula to cover the tinfoil. The advantage of this is that it is not easily displaced while taking the bite. A roll of wax is fitted over this to approximate the height of the lower teeth. In taking the bite the movements of the condyles are not recorded, excepting that they should be in the retruded position in getting the vertical relation between the jaws. The Hall theory is that the tactical sense of the cusps tells the jaw where to go, and not the jaw the teeth,

that the planes and position of the teeth are the guides of the mandibular movements, just as the rail guides the railway train.

The median line and lip line are marked on the base plates, also the curve of occlusion determining the position the teeth are to occupy. The bite plates are fastened together and removed from the mouth. Dr. Hall outlines a technique for mounting the casts and bite plates on his articulator, which, so far as I know, is not yet on the market. But I believe good results can be gotten with any articulator that conforms to the Bonwill triangle and has an incisor guide incline. Before setting up the teeth, the inclined planes of the bicuspid and molars above and below should be ground to the same angle as the incisor guide incline. In the new Hall, I believe it is 45 degrees. In the Gysi Simplex that I use, it is 33 degrees. After setting up the teeth, trying them in the mouth, satisfying yourself that the distance you have established between the jaws is correct, and that the patient's lower jaw was in the retruded position, the dentures can then be finished.

I will now close by quoting, verbatim, from Dr. Campbell's writings, "a method of correcting the bite under normal biting stress." The distribution of stress or pressure over the entire area of the supporting structure is of prime importance and is absolutely essential if the dentures are to be worn with the utmost comfort and serve in the most efficient manner. To expect that the equalized pressure obtained in taking the impression can be maintained through the subsequent procedure, and especially where casts of plaster and bolt flasks are used, is folly. If, by the most careful technique and attention to details, the operator succeeds in securing three points of contact, porcelain to porcelain, he is justified in believing that his method of procedure has been comparatively faultless.

"Dr. Rupert E. Hall, formerly of Houston, Texas, advises that a thin sheet of yellow base-plate beeswax be placed upon the lower denture, covering the entire occlusal surface of all the teeth, and a corrected bite be taken with both of the completed dentures in position. The dentures are then returned to the articulator, sealed together, and the new relation maintained in the old position by constructing a new cast for either the upper or lower. The teeth are now automatically ground, by placing a mixture of No. 90 grit carborundum powder and glycerine upon the antagonizing surfaces

and working the articulator to correspond to masticatory movements of the human mandible. The writer takes great pleasure in stating that the above method of equalizing the normal biting stress has been a source of more satisfaction than any one particular 'stunt' that he has acquired in several years."

NOTES ON PHARMACO-THERAPEUTICS.*

BY JAS. C. DONELAN, D. D. S., SPRINGFIELD, ILL.

The science which embraces the study of the action of remedial agents when applied to human tissue in the treatment of disease is at present known as Pharmaco-Therapeutics.

The two great groups under which all remedial agents may be classified are:

- I. Those which have no definite action on a specific organ.
- II. Those which do have a definite action on a specific organ.

Under the first group are placed (1) Antiseptics, (2) Astringents, (3) Caustics, (4) Hemostatics and (5) Styptics. All other classes of remedial agents fall in the second group.

ANTISEPTICS.

Antiseptics are drugs which, when applied, inhibit the growth of micro-organism and their spores.

However well an antiseptic performs its work after an infection has set in, it is primarily important to prevent infection by the absence of micro-organisms in the field of operation. This can be quite successfully accomplished by sterilization and ordinary cleanliness. In using antiseptics it must be remembered that remedies which attack vegetable cells (pathogenic micro-organisms) also destroy animal cells (body units), the animal cells being generally the less resistant.

It is important to remember that antiseptics inhibit the growth of micro-organisms and spores; that Disinfectants and Germicides destroy micro-organisms and spores and overcome their end products; Antizymotics attack ferment bacteria, especially.

I. SALTS OF HEAVY METALS AND THEIR OXIDS.

1. Corrosive Sublimate (Hg Cl₂) is a powerful antiseptic.

*Read before the Sangamo-Menard Dental Society.

Its use is limited in dentistry because it coats instruments with free mercury. It is contra-indicated as a mouth wash because its continual use destroys the mucous membrane of the mouth, and because it is a poison to the general system. A (1:1000) solution is used in dentistry for sterilizing area included in rubber dam.

2. Bismuth Subnitrate is used in dentistry and medicine to insert into sinuses as pack and dressing. Beck's paste is an example. This paste is useful to locate tracts and organs in X-ray procedure, the Bismuth not being penetrated by the ray. Bismuth Subnitrate is not an inert substance. It should be used with some caution, as deaths have been reported caused by its careless use. It is a constituent of a few dusting powders, in which purpose it acts to diminish the secretions of the wound and to aid in making area antiseptic.

II. ACIDS AND ALKALIES.

A. *Acids.*

All acids possess more or less antiseptic properties. Acids in strong solutions are caustics; in weak solutions are astringents.

1. Boric acid is a mild, non-irritating antiseptic. It is very frequently prescribed in mouth washes. It is more effective on mold and fungi than on pathogenic bacteria. Boric acid must be used with caution in dusting powders, as it is readily absorbed, causing ill results. It is a constituent of Liquor Antisepticus, a standard antiseptic mouth wash.

Inorganic acids, except Boric acid, must not be used in the mouth because of their destructive action on dental enamel. HCl, for stomach treatment, should be administered through a tube.

Of inorganic acids, outside of laboratory use, only Sulphuric acid and Phosphoric acid are used in dentistry.

2. Sulphuric acid and Phenol sulphonic acid are used in opening into tortuous root canals and in cleaning *all* canals after removal of pulps. Phenol sulphonic acid is preferable to Sulphuric acid because of its lesser flow. Aromatic Sulphuric (an alcoholic Sulphuric acid solution flavored with ginger and cinnamon) is used to cauterize pus tracts and pathogenic bone areas.

3. Phosphoric acid ($H_3 PO_4$) is used in dental cements as liquid.

B. *Alkalies.*

The power of alkalies as antiseptics depends upon their power

to disorganize albumin. Hydrates of alkalies are powerful antiseptics; carbonates of alkalies are weak antiseptics.

Under this group come some of our most popular antiseptics: (1) Soap, (2) Liquid Soap, (3) Lime, (4) Chlorinated Lime is a bleaching agent also, (5) Sodium Chlorid. A saturated salt solution is a mild, neutral antiseptic mouth wash. (6) Ammonia is a mild antiseptic, but is also an irritant. (7) Hydroxids of Sodium and Potassium are powerful caustics. They are used to remove organic matter from root canals, as Sulphuric acid is used to attack inorganic matter. (8) Borax. A borax solution mouth wash is valuable in cases of thrush and stomatitis. (9) Liquid soap. This is a combination of (1) alcohol, (2) linseed oil, (3) K Hydroxid, (4) and an active antiseptic.

III. HALOGENS AND DERIVATIVES.

The action of the halogens depends upon their substituting the hydrogen atom of water with their halogen atom. The acid formed precipitates albumin. They act only on the presence of moisture.

1. Chlorin in aqueous solution is an active antiseptic.

2. Sodium Fluorid is a powerful antiseptic. It is used to prevent fermentation, being an antizymotic. In theory it is indicated in a mouth wash, as dental caries results from fermentation.

3. Ammonium Bifluorid, an antiseptic, is advised by some leaders as a tartar solvent. Condemned by others because of roughened enamel surface as a result of its use.

4. Chlorinated Lime is used as a disinfectant for bedding, excreta, etc.

5. Iodin is the most popular antiseptic in surgery. It is a true antiseptic. It is irritating only to the extent that it stimulates cell activity, and it is penetrating.

In surgery, after skin is washed with soap and warm water, iodine is used to sterilize the integument. Iodine is painted by rubbing in tincture. The tincture keeps the bacteria fixed to the surface during the operation.

Iodine is also used after sutures are removed from a wound to stimulate cell growth to eliminate uniform fissures. Wounds treated with iodine leave a small, clean scar. Iodine is also a deodorant. Tetanus and Tubercular bacilli are readily destroyed by iodine.

Salts of iodine are used internally to favorably influence metabolism in the third stage of syphilis.

Solutions containing iodine are used as irritants.

Iodoform is an aromatic compound of iodine. It contains 96 per cent iodine and liberates this when dissolved, acting more quickly in the absence of air. Since nascent iodine is very active, many prefer to administer iodine in this manner.

(a) Iodoform—

1'. Deodorant.

2'. No way of disguising its own odor.

3'. Gauze indicated to be used in purulent tracts and difficult eruption of 3rd molars.

(b) Uroform Paste: Consists of—

Orthoform, 40 parts.

Europhen, 60 parts.

NOTE:—Orthoform is a local anesthetic and is present to control pain. Europhen liberates nascent iodine, disinfecting field. Iodine poisoning, Iodism, is manifested by feeling of cold in the head and by salivation.

IV. SOLUTIONS WHICH EVOLVE NASCENT OXYGEN.

Molecular O is not active, but nascent O is very active as an antiseptic, having great attraction for albumin.

The source of nascent O is from (1) ozone, and (2) from dioxids.

In the manufacture of dioxids heat is required, so in liberating of O, heat is liberated. NOTE:—Arsenic trioxid comes under this group.

1. Ozone is a gas, but is not in common use because of its being an unstable compound.

2. Dioxids are all solids except H_2O_2 . They are fairly stable compounds. Metallic dioxids, after liberating O, have left a very irritating dioxid. This limits their use as antiseptics.

3. Hydrogen dioxid is contra-indicated for use in the mouth wash, as the commercial solutions of it contain free Sulphuric acid to aid its stability. Hydrogen dioxid must not be used in a restricted pus cavity because of the possibility of effervescence forcing bacteria into healthy tissue. Hydrogen dioxid delays wound healing by its destruction of cell granulation. Hydrogen dioxid is used as a test for root canal dressings to show the presence or absence of putrescence.

Pyrozone is a 25 per cent ether solution of hydrogen dioxid; it is used as a bleaching agent.

4. Magnesium dioxid, Calcium dioxid and Sodium dioxid also are in this class, being metallic dioxids. Sodium dioxid is a bleaching agent.

5. Borax is used in mouth washes as a mild antiseptic. Its reaction is slightly alkaline. In dusting powders, borax is a convenient way to administer nascent O on wound surface; for borax to act, moisture must be present.

6. Potassium Permanganate. A local application of potassium permanganate is indicated in cases of snake bites. It is contra-indicated for use in the mouth, as it leaves a persistent discoloration on teeth and acts deleteriously on tooth structure.

V. AROMATIC SERIES.

The balsams, spices and wood-tar from early times have been used to prevent decay and to aid healing of wounds.

A deviation from modern dental therapeutics to consider something interesting is an outline of the method of embalming used by the ancient Egyptians.

- a. Brain and viscera were removed.
- b. Body thoroughly washed in brine, and
- c. Saturated with aromatic substances and bitumen and laid several days in brine.
- d. Dried and wrapped in aromatics.

This procedure has resulted in the preserving of some of these bodies more than two thousand years.

1. Phenol. The use of Phenol as an antiseptic was first advised by Lister in 1868. It is the standard of all antiseptics. It is a cauterant, relieved by application of alcohol. The great drawback to the antiseptic power of Phenol is that it does not penetrate, due to its precipitation of albumin.

2. Thymol is a weak antiseptic, but is a pronounced penetrator. It is added to many root canal dressings because of this property. Phenol compound, Thymol 40 grains, Phenol 3 drams, Menthol 20 grains, is an example.

3. Creosote (Beechwood). Used as antiseptic in treatment of Phthisis. Indicated as anodyne in case of odontalgia, where

dressing is not going to be re-applied for several days. The odor is an objection to such use.

Guicol. Guicol is advised in the treatment of pyorrhea. It is also used to combat the tubercular bacillus.

4. The least poisonous of acids of aromatic group are salicylic acid and benzoic acid. Salicylic acid must not be used in the mouth, as it acts very deleteriously on tooth structure. Sodium Salicylate is a specific in acute rheumatic conditions.

5. Balsam of Peru. This is a mild antiseptic. It is used to fill root canals. In such a procedure mouths of canals are sealed with amalgam. This operation is obsolete.

VI. ANTISEPTICS OF MARSH GAS SERIES.

1. Methyl Alcohol. Wood alcohol is used more in commerce than in therapeutics.

2. Ethyl Alcohol—Grain Alcohol. Sixty per cent solution has greater antiseptic value than 95 per cent. The latter does not penetrate, due to its great dehydrant power. Alcohol is a solvent for many drugs administered internally. It is used as a dehydrant in dentistry. Denatured alcohol is 90 per cent alcohol to which 10 per cent aromatic poisons are added, making it unfit for internal use.

3. Formaldehyde is the most powerful disinfectant known. It is very irritating to animal tissue. Formaldehyde is used in dentistry to neutralize putrescence in root canals. Formo-Cresol (*Buckley*) is equal parts liquor Formaldehyde and Cresol.

The vast majority of the members of the Marsh Gas Series are depressants of the nervous system. NOTE:—Alcohol comes in this group.

VII. ESSENTIAL OILS.

These are derived by various means from plants. The oils are usually colorless, sparkling liquids; age, exposure and foreign matter add color to them. Agitated with water, the oils form a milky fluid, from which the oil separates, imparting odor and taste to water.

The value of essential oils as antiseptics is greatly overestimated. Better results are obtained from their active ingredients than from the use of the crude essential oil; Eugenol more effective

than oil of cloves, Cinnamic Aldehyde than oil of Cassia, Eucalyptol than oil of Eucalyptus.

The essential oils in part are:

1. Cassia is a good antiseptic, but it discolors tooth structure. It is the most pleasant flavor for the majority of people.

2. Eucalyptus is a solvent of gutta percha.

Eucalyptol Compound (Menthol 2 grains, Thymol 3 grains, Eucalyptol 1 dram) and Gutta Percha are the ingredients of Eucapercha Compound, a preparation to replace Chlorapercha in root canal work.

3. Mustard is advised to remove odor of iodoform from hands.

4. Menthol—a local surface analgesic and anodyne. A hot solution is used to relieve tri-facial neuralgic pain by applying on cloth over part affected.

5. Thymol is a mild antiseptic and a persistent penetrator.

Three derivatives of essential oils are: (1) Cinnamic aldehyde from cassia. This will not discolor tooth structure. (2) Eugenol from oil of cloves. Eugenol is used with calcium phosphate in pulp capping, also as anodyne in toothache. (3) Eucalyptol from oil of eucalyptus.

ASTRINGENTS.

Astringents are used in dentistry to contract and tone flabby tissue. An astringent mouth wash is never indicated, as they decrease the flow of saliva. Zinc Chlorid is a good representative of this class. Zinc Iodid constituent of Talbot's solution is an ideal astringent.

CAUSTICS.

Caustics are used in dentistry to destroy excess tissues, to cauterize pus tracts, to stop hemorrhage and to inhibit dental caries.

Silver nitrate is a caustic. In solid form it is used as a styptic. A solution is used to prevent dental caries by causing it to unite with organic material on the surface, thus forming a char which protects deeper tooth structure from bacterial invasion. This formation of a char also relieves hypersensitive dentin.

Arsenic trioxid is another caustic. It is used in dentistry in devitalization of dental pulp.

Caution before applying devitalizing agent (As_2O_3): (1) Pulp pain must be absent. (2) There must be no blood in cavity, for it

forms inert arsenate hemaglobin with As_2O_3 . (3) Pulp to be depleted by puncture or by gradual chilling, if pulp is congested, before applying agent.

Glycerin is probably preferable to any liquid for carrying Arsenic Trioxid powder or fibre on cotton into cavity. A local anesthetic may be added if indicated.

STYPTICS.

Silver nitrate in solid form has been suggested as a styptic. Zn Cl solution is an ideal styptic. Monsels solution must not be used in the mouth, as it forms an unpleasant coagulum and it injures tooth structure.

Powdered gum tragacanth is a protective, but is used in dentistry more often to aid in retention of dentures.

Irritants and Counter-Irritants. Counter-irritants start circulation from deep-seated parts through irritation on surface. Iodin is a favorite in this use. To make iodin solution colorless when it is to be applied on outside of face, add ammonia water.

Cerebral stimulants excite motor centers. Coffee and tea generally discourage sleep. Alcohol stimulates, but this stimulation is followed by depressant action, which produces sleep.

Chloral hydrate is being used by some men of the dental profession as a stimulant. It is not a stimulant, but a depressant and a true hypnotic.

Valerian is a sedative. Its administration is advised as a prophylactic measure to seasickness. In such cases it is given in Bordeaux wine.

The purpose of cathartics is to unload the bowels. Saline cathartics are the ones most generally prescribed by dentists. Magnesium Citrate is the most desirable saline cathartic, and is pleasant and effective.

Sialogogues and Anti-Sialogogues. These agents increase or decrease the flow of saliva. Ropy saliva is generally due to acidity of saliva precipitating albumin. Organic acids are sialogogues. Atropin is an anti-sialogogue.

Zerostomia (dry mouth), due to (1) physical or nervous disturbances. (2) Psychic disturbances or (3) local foci of infection.

PRÉPARATIONS FOR THE MOUTH AND TEETH.

In considering this subject, we must not lose sight of the fact that mechanical cleansing is always of primary importance in the

care of the dental organs and supporting structure. With this in mind, mouth washes and tooth powders and pastes are most important to consider.

Requirements of a mouth wash: (1) Must not act deleteriously on teeth or mucous membrane. (2) Must be non-poisonous. (3) Must have pleasing taste. (4) Must possess sufficient antiseptic action.

It is not absolutely necessary to have a mouth wash or tooth powder or paste alkalin; in fact, an acid mouth wash is often, if not always, indicated. Those practitioners who set so much faith in alkalin mouth preparations lose sight of the fact that bacteria thrive in an alkalin media. The conclusion must be that alkalin preparations aid in proliferation of acid-producing bacteria and thus bring about, eventually, greater acidity than before the use of alkalin mouth wash.

Tooth pastes and powders intended for daily use should not be so gritty that their use in time causes abrasion of enamel, but should be firm enough to cleanse tooth surfaces. Charcoal must not be used to cleanse teeth, as gum margins become tattooed after continual use over a long period.

In this short time this evening we have skipped through the subject of Pharmaco-Therapeutics very quickly. You may be impressed with the wonders of therapeutics, for you know from observation and personal use that remedial agents when applied have performed and are performing many wonders. Regardless of this, we must not lose sight of the fact that remedial agents only assist nature to combat disease. It is far preferable to prevent disease than to cure it. So, keeping the body organs well nourished and exercised and through mechanical and therapeutic means maintaining normal functions, that disease can be prevented, is the thing to be given primary consideration. That is the keynote always: "Prevention rather than cure."

EFFICIENCY IN THE DENTAL OFFICE.*

BY W. A. JOHNSTON, M. D., D. D. S., PEORIA, ILL.

The question of bread and butter is before the American public to-day as never before. As dentists, we are interested not only in filling our patients' mouths, but also our own. The high cost of living has made it necessary for us to earn more money than we did thirty, twenty, ten, or even five years ago. How are we to get the coin? We claim to be a learned profession—as such we are expected to give more and better service than the day laborer, and our services are not always measured by dollars and cents.

This being the case, we cannot arbitrarily raise our rates per hour, as a plumber does, nor add 10 per cent to the selling cost of everything, as the dry goods merchant or the coal man. How, then, can we in justice to our patients, earn enough in these strenuous times to pay for the hog and hominy necessary to feed our families?

Three ways present themselves for our consideration—form a union, raise the price of services of all kinds, and stick to it. This I do not approve of a little bit, for the reasons which will appear indirectly in discussing other phases of the subject.

The second method employed by business men for the increasing of profits is by eliminating waste and cutting down expenses. Of late years the fad has sprung up of having a double equipment. Two complete operating rooms, exact duplicates of each other. This is an excellent thing for the dealers in dental supplies, and you will notice that they are the most ardent supporters of this idea.

However, until I can secure two nervous systems, an extra pair of hands and another back, I do not care to attempt to do two dental operations at once.

Looking at the matter from a purely business standpoint, I do not know a single manufacturer of anything from flour to automobiles who is willing to have 50 per cent of his plant lying idle all the time.

This is exactly what happens to a dentist when one-half of his outfit is inefficient, and it can only be efficient when it is working. Suppose a man can fit up an operating room for \$500 with every-

*Read before the Peoria County Dental Society, November 5, 1917.

thing he needs for the successful carrying on of his practice. This room takes up space for which he must pay \$10 a month rent, or \$120 a year; interest at 6 per cent is \$30 a year. The tax man will want \$15; insurance, \$4; depreciation, 10 per cent, \$50. This figures up \$225 a year, which is a perfectly legitimate expense—but two operating rooms will double this in a perfectly unnecessary way. Instead of increasing our expenses we should try to cut them down, if, in these strenuous times, we expect to make a living.

Here I am met by the argument of the dealers in dental furniture. Oh! but you can do so much more work if you go from one room to the other and find a patient already in the chair, with the mouth open, waiting for you to begin your operation at once. Gentlemen, no greater fallacy was ever offered to a gullible profession. You need the rest and relaxation which comes in the intervals between operations as much as you need rest in sleep after the day's work is over.

The masters of the art of efficiency insist on certain definite periods of rest in the midst of the activities of the day. If a man is on his feet constantly they make him sit down for so many minutes at a time, several times a day, the number of periods of rest depending on the violence of his exertion. If he sits at his work, the efficiency man makes him stand or walk while resting.

In a lifetime a man is good for about so many hours of work. If he wishes to take things a bit easy and spread his working hours over a long period of placid and contented years, he may do so. If on the contrary he wants to crowd on all steam, neglect his health, ruin his disposition, forget his duty to his friends and the world at large—and do all his work up in a short time, he still has that privilege, but—mark my words, he cannot do both. He cannot eat his cake and keep it.

I have in mind a man, whom I have known for a number of years—he was doing well in his profession, held an honorable place in society, and a warm place in the affections of his friends. He had time for public service, society engagements and church work. His eye was bright, his skin clear and his temper sunny. He was a good, clever, generous, likable man.

One day a double equipment promoter got hold of my friend, remodeled his office, put in twice as much stuff as the poor fellow could use, saddled him with a big extra expense and promised that

the additional equipment would soon pay for itself in added business. So far as increased business was concerned, the agent's prediction proved true, but the price paid for the increased business was a tremendous one.

It soon became necessary to have another assistant to take care of the reception room and the books. Then the dentist had to earn enough more to pay for his new secretary.

Three years later I met my friend and hardly knew the hollow-eyed, sallow-skinned old grouch for my old-time sunny-tempered friend. He had aged ten years in three, and the most pitiful thing about the whole transaction was that he didn't know that he had changed a bit. He admitted that he was so tired at night that he had given up all social functions, church and lodge work, but gave as his excuse that he had lost interest in such matters and didn't seem to care for them any more. Could anything be more pitiful—a man old before his time, broken just in the prime of his life, almost used up and not able to see what was the matter with himself; and let me whisper to you that in his haste and hurry he was neglecting his work, wasn't able to keep up his reading and his practice was beginning to fall off.

Well, if we increase our expenses we must also increase our income, and the accepted way that the business world recognizes is to increase the product. In the pursuit of efficiency, business managers have tried to eliminate all false movements and delegate to others the less important work. This was impressed on my mind in 1889, long before Taylor's first article on the subject appeared in the magazines.

The First Presbyterian Church was in progress of erection on Crescent Ave. Being a member of that church, I was an interested spectator, and saw bricklayers who were earning \$3.50 per day building the scaffolding, while their \$1.50 a day helpers stood around, doing nothing. You don't see that to-day. The bricklayer who gets \$6.00 a day doesn't even have to bend his back, nor turn around to pick up a brick. The helper, at \$3.00 per day, has the bricks on a proper level and within reach of his superior's hand. Can we learn anything from this? My assistant waits on me. I do not wait on, or for, her. If I drop an instrument I do not pick it up, for two reasons. It's her business to pick it up, sterilize it and put it back in its place. My time is too valuable for me to skirmish around on the

floor in search of a lost tool, and get my hands dirty, so that they must be washed before they go back in the patient's mouth.

That's the reason I have an assistant. In 1897 I built a house. One day I saw a half-baked carpenter fitting a lock to a door. He measured the distance from the floor to the bottom of the lock. Then he bored a hole a little way in, took out his bit, measured the lock, measured the hole, bored another hole, took out the bit, measured the depth of the lock, compared it with the length of his bit, bored the first hole deeper, measured the bit, bored again, then bored the second hole, bored two more holes, couldn't find his chisel, so went downstairs after it, cut out the wood between the auger holes, tried in the lock, bored all the holes deeper, chiseled out the frame for the door-plate, pattered and tried it, fooled away a lot of time and finally finished the job in a slovenly way and seemed to be proud of the fact that he got the darned old thing in anyway. He belonged to the Union and was sure of his pay—no matter how he wasted his time, or how sorry his work was when finished. In the next room was a real, sure-enough carpenter, and I took pleasure in watching him. He measured 32 inches from the floor, took the door-plate and measured it with a pair of dividers, marked the edge of the door where the plate should go, selected the proper bit, bored four or five holes in rapid succession, each one a little deeper than the width of the lock, took a large chisel to cut out the intervening wood, cut out the face of the door for the plate, tried in the lock and it fit. It didn't consume one-half the time that the other man took—it was a better job, and it taught me two things—first, that knowing how, made a job easier, and that the good workman is worth more than a poor one.

This isn't all, for the good workman soon became foreman, and is now a prominent contractor, and a few years ago was a member of the City Council. The other man drifted around for a while and then I lost sight of him.

The first man worked without a plan, made a lot of false motions, lost time continually, and while he couldn't be called a complete failure, he never amounted to very much.

A number of years ago a prominent man in the profession made this statement at a meeting of the State Society: "Our patients are not so fond of us that they want to spend two hours under our hands, if the same work can be done just as well in

one hour." I believe he was right, but would emphasize three words—"just as well." Rapidity must not be confounded with haste or carelessness. We must not sacrifice safety for speed.

Let me make a few suggestions that may or may not meet your approval, but which I assure you are worth thinking about. A lot of us paid a stranger a handsome fee to learn how to conduct our business. I make no charge for my lucubrations, and you may have them for what they are worth. To be successful, a man must do business. To do business, he must have a place in which to work, and as he spends most of his time in his office, the office should be comfortable, convenient and attractive. I do not believe it is necessary to fit up a business office like a ladies' boudoir. The office is a business proposition and should be essentially masculine. The dentist stays there all the time—ladies and children only for a few hours, once in a while. A dental office is no lounging place for pink teas and knitting bees, and the fewer folks you have around the more you will accomplish. Besides this, a dentist must work for the millionaire, and milady, the shopgirl, and the butcher's boy, and the latter class largely predominate. He cannot cater to different classes, so why not fix up his office to suit himself.

It goes without saying that everything about the office should be neat and scrupulously clean, from the floor to the operator's coat, from the cuspidor to the excavators.

To do business properly a complete equipment is required, and here the best is none too good. It is annoying, to say the least, to have an imperfect instrument break just at a critical time, when a better grade of tool would have stood the strain.

"But let every man be fully persuaded in his own mind" as to what he buys and what he needs to work with. No one can lay down a cast-iron rule for equipment except, perhaps, it be this—beware of the valise man, who wants to sell you anything from a prescription to a periscope, neither of which you will ever use. Dental offices all over the land are cumbered with junk—be sure you need a thing before you buy it.

Efficiency is greatly advanced by having everything close at hand—compare your grandmother's kitchen, eighteen feet square, with a modern Pullman diner's equipment. The old lady fairly wore her legs off and was short of stature because she

had to walk so far to get a meal of meat and potatoes for six, while the Pullman cook produces an almost incredible number of fancy dishes for eighty people without stirring from his tracks.

If we stop to think a moment we will see plenty of ways for saving time. For instance, we have proximal cavities in a first and second bicuspid. If we go at the second bicuspid first and prepare it, using four burrs to do the work, and then repeat the process in the first bicuspid, we are taking the very slowest and most painful way of accomplishing the desired result. Why not prepare both teeth at the same time, going from one to the other often enough to avoid either tooth from becoming heated until it hurts, and saving the time necessary to change burrs so often.

Suppose we are to put in a silicate filling in a central incisor and insert a porcelain crown in the root of the other central. Isn't it just as easy to prepare the root for the crown, then fill the cavity, and while everything is dry and clean, set the crown, letting your silicate filling be hardening while you finish the setting of the crown?

By proper team work your assistant can save not only steps, but, if trained to it, many precious minutes during the day.

In order to have a good assistant you must catch her while she is young, and keep her as long as you can. The first thing to impress upon her is to keep her mouth shut in regard to what goes on in the office; the next thing is to tell her that you never make a mistake—at least she mustn't notice it while your patient is present. Then, if she learns that she is to anticipate your wishes and wait on you instead of your having to wait on her, or having to tell her constantly what to do, you have a treasure. Don't trade off too often and be constantly breaking in new girls. For instance, the girl should know when you are about to take an impression, that you will need certain things, and need them in a certain order, and when you want them they should be right within reach, without a moment's delay.

If you wish to apply iodine to an inflamed gum, and reach for a swab, by the time you have turned around to make the application you should find her waiting with the open bottle.

I mustn't keep you here all night, but my idea of a successful, efficient practice is one in which the maximum service is

given with the minimum of time and discomfort, both to the patient and operator.

If we can, to a large extent, eliminate pain, avoid long sittings and be expeditious and careful in our operations, economical in our expenditures, and cautious as to whom we trust—well—War or no War, I guess some way or other we will pull through.

The question of fees and book-keeping I regard as minor matters which each individual must work out for himself.

ROOT CANAL OPERATIONS.*

BY J. K. CONROY, D. D. S., BELLEVILLE, ILL.

Probably no subject has taken the attention of the dental profession in the last few years as the problem of root canal operations, and only a short while ago, any dentist who cared for the opinion of his brother practitioner, would be ashamed to acknowledge that he had placed a shell crown of any description over a vital tooth, while at the present teaching the matter of procedure is entirely reversed, which would make one feel that he has spent the best years of his life doing that which he considered proper, and, in fact, scientific, yet such procedure is now condemned; and it seems time for the profession to unite on some form of treatment which promises to give satisfaction, and not be a future source of trouble to the patient as well as the dentist.

The introduction of the X-ray has complicated matters still more, as this recent technique is more or less misunderstood by even some of the brightest men of our profession, much less those of us who proceed with the ordinary daily routine of the dentist.

In my recent work, as a member of the Illinois State Board of Dental Examiners, I have asked the following questions, viz:

1. Give the method of treatment for a putrescent canal.
2. Give the technique of filling a root canal.
3. When form-cresol is sealed in a putrescent canal, what is the chemical action, and name the gases liberated.

*Read at a joint meeting of the Madison and St. Clair District Dental Societies, Nov. 1, 1917.

To give the various answers would consume a whole day, but from my personal knowledge of the various colleges in their teaching, I could at once tell the school from which the writer came. Combining questions one and two, a process which would do credit to an oral surgeon, was given in a number of cases, from three to six X-ray pictures would have to be taken, and the technique, if followed as given by these young artists, time taken into consideration, would result in charging a fee for one tooth as great as the average present operator would ask for probably ten times the actual number. The thorough cleansing of the canals, the different sizes of root canal pluggers and the insertion of canal points to the apex were advocated by most all, and if there was any doubt after two to six months, the patient should submit to a root amputation, and possibly later, extraction of the tooth, as the time may come when this tooth would be the cause of a focal infection.

Question three was answered by many according to the lines advocated by Dr. Buckley; yet others claimed to know nothing about it, as they stated they were not permitted to use it, yet at the last meeting of the Illinois State Dental Society in Quincy, this question was discussed by able men and X-ray pictures shown which would prove that this method was decidedly consistent, until the writer considers that a study of this most important phase of dentistry gradually becomes a matter of personal equation, and what the individual operator feels he can do with justice to himself and patient.

Suffice it to say that all root canal operations should be performed under as nearly surgical cleanliness as is possible, the position or location of the tooth taken into consideration, and I must admit that I have used almost all methods of treatment advocated by different authorities and have been fairly successful with all of them, and have arrived at the conclusion that any drug which will not dissolve or injure the tooth structure will answer, so far as germicides and antiseptics are concerned.

If having isolated a tooth, and cleansed the surrounding tissues, the canals are then to be cleaned. A small broach is passed into the canal as a finder, measuring the approximate distance to an obstruction, and a fine Kerr root canal reamer is used to open as far as possible. This is followed by a medium-sized

reamer of the same type, then a Kerr file is used, which all take only a short time, if proper care is used not to twist off the ends of such delicate instruments. After this, the canal is ready for filling and the use of cotton on broaches for drying canals should be avoided, as all debris can be removed and the canal cleansed as previously stated, and the very nature of the cotton, and the practical impossibility of keeping the hands clean during such an operation, render the use of cotton on broaches, just prior to placing the root filling in position, very dangerous, and, in fact, a rather slovenly method. A small glass tray with a glass top should be used to hold the canal points, which should always be immersed in alcohol, and just prior to use, a few points placed on the edge of the tray to dry before insertion into the canal, the canal being dried by the use of the electric canal dryer, or in the absence of this instrument, a hat blast from chip blower will suffice; the canal is then moistened with eucalyptol and either chloro-percha or euca-percha compound is used and pumped into the canal, as far as is possible. This is followed by canal points, and instead of a root canal plugger, I use a short broach and force this into the mass until it is soft, and if possible get a response from the patient, after which a larger point is used and the end cut off and burnished over the opening, and I have every reason to believe my work will prove satisfactory.

In case of tortuous canals, and those which it seems impossible to fill, I make a paste of zinc oxid and formo-cresol, pump this as far into the canal as possible, cover the opening and pulp chamber with cement, make a record of the operation and inform the patient that the root is not properly filled, and request him to return if tooth gives trouble, and, strange to say, I have had less trouble from this class of operations than any other form of root filling.

I have always advocated the utmost care and made all possible effort to save teeth that are in need of treatment and cannot reconcile myself to the belief that the profession has been lax in this one particular when the subject is constantly before us for years gone by; neither do I feel that it is necessary to ream out one-third of the structure of the root of a tooth in order to make a so-called perfect root canal filling, as I am of the firm belief that when a medium sized root canal reamer can be passed to the apex of a root, it is

possible to fill the canal, just as securely as if hours of time were spent in enlarging such openings.

With due respect for the ideas of others, what is to become of the teeth of the children of the man of moderate means when the amount of time is spent in this manner? Either the dentist must be content to exist on the salary of the ordinary mechanic, or the teeth of the large majority of people must be extracted.

In closing let me say that if all precautions are taken for cleanliness in our root canal operations, we may spend all the time we wish when the patient is willing and can afford to pay any fee asked, but remember as the good book says: "He to whom much is given much will be expected of." And, on the other hand, with careful conscientious work, we may say to ourselves "Well done, thou good and faithful servant."

MEMBERSHIP IN A DENTAL SOCIETY.*

BY H. W. MC MILLAN, D. D. S., ROSEVILLE, ILLINOIS.

The instincts of man are social. He loves to unite with his fellow-man, in the accomplishment of great tasks. He has come up through various stages of development:—first, a roving nomad, seeking his livelihood by hunting and fishing; second, by the domestication of various animals, he led the pastoral life; third, he learned to till the soil, and settled down to agricultural pursuits; and fourth, he established cities, towns, and hamlets, learned manufacturing, and now we have the industrial age, with its complex life, and conflicting interests.

Let us hope the next will be the humanitarian age, in which brotherly love prevails, with relief from suffering, and with truth in righteousness. Let peace abound, for peace resides in justice; justice resides in law; law resides in government, and government resides in the people whom it serves: because "all governments derive their just powers from the consent of the governed."

We are now engaged in a great World War, with its monstrous destruction of life and property, with two huge forces contending for supremacy. War is competition run mad. Out of it all, if there

*Read before the Northern Illinois Dental Society, Oct., 1917.

emerge a United Nations of the World, with one government, giving representation to those weaker nations, as we, in these United States of America give representation to the smaller states, this war will not be fought in vain.

The tendency of the world life, educationally, politically, and industrially, is towards unity and democracy. The statement that: "Competition is the life of trade," is being seriously questioned. Co-operation is becoming the new order of life: we are learning to realize that we *are* our brothers' keepers, and that no man really prospers by living unto himself.

Within the last one hundred years, man has rapidly increased in knowledge and in skill, brought about very largely by his association and communication with his fellows. It is becoming a time of *special* knowledge and skill. Better results could be accomplished by humanity for humanity, if the energies spent for works of destruction, were expended for works of construction—if the efforts to repair were spent to prevent; if the efforts to cure be early instead of late.

Dentistry is one of these rapidly developing branches of *special* knowledge. It is found that man's health depends largely upon his keeping his natural teeth in normal, hygienic, physiological condition:—that the natural teeth crush with ease that which the artificial substitutes fail to crush with the greatest effort. It is found that often the vital organs become diseased by metastatic infection, or, plainly speaking, transported infection carried by the lymph and blood streams to these organs, from bleeding gums, or from abscessed roots of teeth, and which may be causing no discomfort to the patient.

Many and varied instances might be cited, but let a few suffice:

Dr. Charles H. Mayo, of Rochester, Minnesota, states that three-fourths of the Mayo Clinic is abdominal surgery, nearly all of which can be traced to mouth infection.

Dr. Kurt H. Thoma, of Boston, Massachusetts, in his recent book on "Oral Abscesses" states: "In the Robert B. Brigham Hospital for chronic invalids I found that of eighty-two patients, seventy-three suffered from chronic abscesses; some of them also had pyorrhoea, and in the mouths of these seventy-three patients I found three hundred and thirty-four abscesses."

The late Dr. George W. Cook, Bacteriologist, of Chicago, on

examining the decay from two hundred mouths, found the germs of tuberculosis in one hundred and seventy-one of these cases.

Dr. Knopf, of New York City, specialist on tuberculosis, says the most skillful physician cannot help nor cure a tubercular patient who retains decay of the teeth in his mouth, because of re-infection.

Recent studies have shown that rheumatism is commonly caused by infection transported from the mouth.

Endocarditis, inflammation of the inner lining of the heart, is another result of mouth infection.

Efficiency demands of dentistry that a complete and thorough campaign of Public Dental Education be carried on continuously, until the people whom we serve will seek our services in time to prevent these infections from becoming multi-nuclear, and perhaps inoperable.

Dental Surgery, if made use of in time, is preventive surgery. Every dentist should join in dental society work, and contribute his money, his time, and his effort, that this comparatively new knowledge be given to the people without delay.

The National Dental Association has for its slogan: "25,000 members." Can not the Illinois State Dental Society produce 3,000 of these? Where there is a will, there is a way. We should be willing to contribute our individual influence and efforts towards this common good.

Thought makes motive; motive makes action; action makes habit; habit makes character; and character makes destiny. If any are destined to become members of the Illinois State Dental Society, they should be made to think correctly of their duty to the society, and of its value to them.

Motives which impel to any act, might be classified as selfish, unselfish, and mixt. All these motives make their appeal when the question of membership or of non-membership in dental society work is considered. The selfish motives ask:—"What shall I *gain* by membership in a dental society?" To some, this is the only appeal that can be made.

I have been a member of the Illinois State Dental Society twenty years, thanks to the kind invitation and recommendation of my friend Dr. Daymude, of Monmouth. It was in the year 1897, the year following my graduation, the state meeting being held in Peoria that year, and Dr. C. R. Taylor, of Streator, the well-beloved by all

who knew him, was the president. In those days, before the reorganization in 1905, the total membership was small, and I learned to know many of the leading men in dentistry. The average membership for those eight years was 353, while the average attendance was only 163. I have kept a complete file of the transactions since I united with the society in 1897.

The motives which induced me to join were mixt, and not wholly altruistic and unselfish. I realized the necessity of attendance upon the state society meetings, that I might better serve humanity, but also that I might have the satisfaction of learning the latest methods. The social side also appealed to me, and each annual meeting was like a class re-union. There is great comfort in knowing and discussing with these men, the problems that are common to us all. There is also satisfaction in the thought that one has a part in an organization like the Illinois State Dental Society, and not, as it were,—alone in the world.

Before the reorganization, there were seventeen counties in western Illinois known as the First District Dental Society. I served as its secretary several years, and once as its president. When the reorganization came, the First District Dental Society was discontinued. Its work for Western Illinois was similar to that of the Northern Illinois Dental Society.

I have served as president, and for several years as secretary of the Warren County Dental Society. It seems natural for me to be in dental society work. It is hard for me to understand why so many are not members of the Illinois State Dental Society.

I give all this personal reference just to let it be known how I feel about dental society matters. I dislike personal mention, but some things cannot be completely stated in an impersonal way.

Wisely or unwisely, I have been made Chairman of the State Membership Committee. One District Superintendent of Membership has been appointed in each of the Seven Districts composing the Illinois State Dental Society. There are more dentists in Illinois who are not members of the Illinois State Dental Society than the number who compose its membership. Why this lack of interest in things so vital? Such a condition should not continue.

When the state society was reorganized in 1905, it made a great gain in membership, increasing from less than 500, to over three times that number. Since the reorganization of the National Dental

Association, the establishing of the National Dental Journal, and the National Research Commission, the time is ripe for another increase in membership. If the National Dental Association meets in Illinois next year, as we hope, and expect it will, this should serve as a great inducement to increase the membership.

This increase in membership must be brought about locally. Your State Committee can help you to get organized for the campaign, and receive your reports, but the actual work of solicitation must be done at short range, as it requires the personal touch to be effective.

I believe as President Hinkins has suggested: that dentists do not, as a rule, meet sufficiently often; that at least quarterly meetings should be held; and that where as many as eight or nine meetings a year are held, the conditions of membership are improved. Personally, I try to be the first at a meeting, and am usually the last to leave. I always have a fine time with any number of the boys, as they all will testify. I find the benefits of membership beyond estimation, and recommend to those outside to get in, true-heartedly, whole-heartedly, and see if the benefits are not as I say.

While membership in a dental society *gives certain benefits* not otherwise obtainable, it also *requires certain duties*, but no more than *every* dentist *owes* to his profession, whether he unites in, or holds aloof from its society work.

He who invests his time, and money, and effort in dental society work, makes one of the best dividend producing investments of his life, and one which reverses and misfortunes cannot take from him. What better investment can a dentist make than that of a membership in his Local, State, and National Dental Societies?

He feels that he is doing his part in the search of dental truth and righteousness. In his discussion of dental subjects, he is adding to the total sum of dental knowledge, and blesses humanity thereby. What dense ignorance and suffering would have resulted, had not dentists sought to improve themselves and others in the work, by uniting in dental society clinics and discussions!

Those who have written our most valuable text-books on dental subjects were, and are, members of our dental societies. Also those who most successfully teach in our dental colleges, are members of our dental societies.

Every dentist who is licensed by a state, to practice upon its

people, *should* feel that he is debtor to the dental societies for the knowledge which he possesses. He should feel in duty bound to unite his efforts with those of others in dental society work. He has inherited vast funds of knowledge from his predecessors, by means of dental society work. He should strive to bequeath to future generations, a higher efficiency, and conception of dentistry than that which he has inherited. Oral hygiene and prophylaxis should be stressed. Where there is no progression, there is retrogression.

Membership in dental society work is a moral obligation all dentists should be *glad* to assume. *Gratitude* and a *desire to serve* should be the leading motives to this choice. *The love of righteousness in the human heart impels many to deeds of nobility, not required by law.* He who does only as much as the law demands, would be a more happy and useful citizen if he did more.

Ethics is the science of human duty. A dentist may feel that he has done all that the law requires of him, when the state grants him license to practice upon its people. Though not *legally required*, he should feel *morally bound* to unite with his fellows in dental society work, to develop the science and art of dentistry to its point of highest efficiency. To be truly ethical or dutiful, one should serve humanity by unifying in Local, State, and National Dental Society work.

There are dental problems which can best be solved by such an organization as the National Research Commission, which benefits all, yet gets its support from the membership of the Dental Societies. A dentist should really feel ashamed of himself if he fails to contribute his help to dental society work.

Why are not more dentists members of our dental societies? Do any feel that the dental societies are not conducted just right? Then it is their *duty* to their chosen profession to get into the work and improve matters. Is it because they have not been invited, and urged to join? Then that can and should be helped by our own membership.

Our dental societies serve as post-graduate schools, which all should join and attend. The association with fellow dentists helps one to avoid the ruts and pitfalls of practice. *One should never feel that he knows all that he needs to know. SELF COMPLACENCY IS THE PARENT OF DECADENCY.* The time surely comes when such an attitude towards learning must be changed.

Without vision the people perish. People are perishing for lack of efficient scientific knowledge. Infections are running riot, which could have been very easily prevented, by timely knowledge and use of Oral Hygiene and Prophylaxis. An ounce of early forethought is better than a ton of late regret. Why should half the dentists be content to let things go as they are? Why not all unite and contribute our respective shares to a National Campaign of Public Dental Education, through the National Dental Association? Let the National Dental Association use the press in bringing to the people this needed knowledge. Let the Press stress the needs for Oral Hygiene and Prophylaxis with increasing vigor. Let it become a disgrace to have the "tooth-ache" and the disgusting disease pyorrhea, which is the result of neglect. Make use of the slogan proposed by Dr. H. R. Raper, of Indianapolis, Indiana: "Never let a tooth ache. If you do not know what this means, ask your dentist." Collectively the responsibility is upon the Association. Individually, the responsibility is upon you. Are you doing *your* share towards making such publicity possible. You have the ability to join in such a laudable movement, therefore the responsibility.

Let none continue to follow the wrong road:—the road which leads to mean, narrow, selfish, shameful isolation,—but rather, let all dentists unite in dental society work in its search after truth;—truth which is for the welfare of humanity.

BLESSED BE DRUDGERY.

BY E. F. SCHEWE, D.D.S., ST. LOUIS, MO.

Is not this subject a paradox, a contradiction in terms? Is it not just this constant drudgery of life, this daily plunge into exacting work, care and disappointment—that wastes patience, deadens sensibility, and blackens the star of hope in the sky of the soul? Besides, what value has this everlasting grind with its sense of doom to my soul, to my happiness, or to the larger welfare of my kind? There are no opportunities for heroism, no intensive moments that gleam and glow and move. One day is a copy of the last and a model for the next in this gray world.

Now all this is quite true of involuntary drudgery, which is, in fact, a sort of slavery. And let us recognize at the outset that

certain forms of slavery still exist; that the children of Gibeon, alas! continue to be hewers of wood and drawers of water.

How can the "man with the hoe," bent, hopeless and debased, ever find joy in toil that is unremitting, excessive, sometimes deadly, that drains his energies swiftly until as truly as the slave, he dies beneath the lash? While traveling recently you saw this man, who in winter's frosts and summer's fires, with bent back and weary muscles and blackened face was toiling at leveling the hills, or exalting the valleys, spanning the rivers or tunneling the mountains, laying that steel highway in order that you and I, seated comfortably in a modern lightning express train, might skip along, hastening the process of hours, devouring distance and cheating even Father Time himself. On that same train, lounging upon the soft cushions of a Pullman parlor car, you saw a youth who represented the opposite extreme of the social scale: he was the son of a plutocrat, the child of idleness and of riches. In him the faculties were, indeed, relaxed, unstrung—he followed no summons to the treadmill of labor, but what sort of a man was he? Having no worthy end in life, nothing to measure the day or year by in terms of wisdom, and service and influence, his highest aspiration consisted in gratifying his ever coarsening appetites, until his very soul was being strangled by his intestines. When he finally dies of "fatty degeneration," the only legacy he can bequeath to the world will be an atom of dust.

There are, indeed, plutocratic fathers who once, too, labored in their shirt sleeves and with parental wisdom force their sons to learn the lessons which hard work brings. With their sons' drudgery is optional, but with you and with me it is not a matter of choice—it is forced down our throats; it is squeezed into the very marrow of our being, but it becomes the iron of our constitutions. Work we must whether we will or not, from early until late; diligently, accurately; we must smile when we would fain frown, wade when we would fain sleep, yet the qualities this training brings is of far more value to ourselves and to our fellowmen, than to have our lives sweetened with sugar water, or to gallop on horse-back to "success." For those things alone are helpful and precious which force a man to sweat and strain, which cost him the effort of his brain, the anguish of his soul. "All noble things are difficult, are rare," said the sage of Holland. The petty difficulties of life are not

necessarily a misfortune, indeed, they may prove a blessing in disguise. They put stamina into a man of fibre, so that in the hour of trial he stands the test. He is like an anchor in the storm; when the tempest raged, and the billows roared, and the whirlwinds swept, it clutched the bed-rock and held fast to its appointed place. Every stroke of the arm, every drop of sweat that entered as a factor in the making, looked with pride on the achievement.

Life is not a "Young Ladies' Finishing School," it is a university in which Drudgery, this stern dame in her sombre robes is our principal tutor, yet it is at her feet that we realize ourselves and unfold ourselves. With this grim companion ever at our side, we cannot follow the easy, the pleasant, the selfish—we are trained to regularity, industry, concentration, usefulness and thus the highest moral qualities are unwittingly developed: patience, endurance, self-respect, and above all the feeling of kinship and brotherhood in toil with all the world. And thus we learn that when at our best we are not creatures, but creators of circumstances; that ours is largely the master-hand, the magic alchemy which changes malediction into benediction, which transforms stumbling-blocks into stepping-stones, and transfigures the hideous hog of poverty into an angel of light, that guides us in the better way.

Now this discipline, which Drudgery brings, is as necessary for the giant as for the dwarf. Look to those who have become masters in the larger fields of human endeavor, how they toiled at their task. Pitt said the secret of a prime minister is infinite patience. Webster insisted: "It is to work, and not to genius I owe my success." Wattes was asked: "With what do you mix your paints." He replied: "With brains," and he might have added "sweat." Patti thought that if she neglected her voice three days, the world would recognize it. Dickens said: "To make my imagination work, I must drudge." An eminent oculist declared that he had spoiled a hat full of eyes, before he could treat one successfully and Beecher said that a young preacher must put a hundred congregations to sleep before he could keep one awake. So drudgery becomes a necessity and high benefit. Hard work at one thing is the only recipe for success in any field—there is no other highway to this goal. One thing done is finally easily done until the performance of it becomes life's recreation. The world today teaches *concentration*, *specialization*. The old-time lawyer for instance of the Lincoln type, has

passed—we now have court lawyers and civil lawyers and these main groups are subdivided into classes. Then there are the doctors—a doctor for every fragment of our anatomy. Doctors for the eyes and for the nerves, for the kidneys and for the lungs, for the teeth and for the toes. Doctors who only study in laboratories and never practice, and doctors who only practice, and never study. However, have you ever read the story of the French physician, Pasteur, how for over twenty years he drudged over his test tubes and bottles more than any washer-woman ever drudged over her tubs, studying the subject of fermentation, how grapejuice is changed into wine by diseasing it, and how wine is changed into vinegar by diseasing it, thus laying in these experiments the basis for his marvelous discovery of antitoxin, which has snatched ten thousand children from the jaws of a diphtheritic death? For a quarter of a century this man toiled without the least assurance of final victory, wearing himself out until the danger of paralysis was near. To his physicians, who urged him to rest, he said: "I have no time to relax." He became a veritable martyr of drudgery to science until stricken with paralysis. Half paralyzed he still worked on to solve the problem of Tuberculosis until the hour of death came. To a few faithful students who surrounded their master, and whom he had infected with the bacillus of work, he gasped the dying words: "We must work on."

When we remember the solid and permanent labor of such stalwart men, whose shadows are so vast and lasting, yes, whose very shadows are substantial, does not the spirit of complaint serve a species of blasphemy?

You may have heard or read of a certain schoolmaster who had many pupils. To some of these he opened his garden, and bade them cultivate flowers. "Fail not," said he, "to bring your fairest flowers to me." But forgetting the master's word, they revelled in the luxuries of the garden, and wove the flowers into garlands to wreath themselves withal.

To others of the pupils the master opened his library and requested them to ponder the rich stores of wisdom contained therein. "Fail not," said he, "to bring the fruit of your reflections to me." But these, too, forgot the master's request, and became absorbed in the trivialities of their studies. Still another group of pupils the master appointed to entertain the guests in the festive halls. "Fail

not," said he, "to bring the guests at last to me." But these pupils were selfish; they spurned the guests of mean attire and feasted and revelled only with the charming ones. But there were other pupils whom for some unknown reason the master commanded to perform the mean and laborious tasks of his household; they toiled from early until late day by day. But behold! these drudges thought of their master, their very tasks made them think of him. True, they could bring no flowers, nor books, nor guests; they could only tell of the hard labor performed, but also of how implicitly they had obeyed his will.

Success or failure in life will be finally determined, not by our conditions, nor by the nature of the task allotted, but by faithfulness to duty despite our conditions. Selfishness is not the spur that drives, nor vanity the star that leads, nor fame the vision that beckons us. There is something in our task that draws us to worthy achievement, that makes us feel that in its fine performance we are not only fulfilling the law of our being, but are giving to life a real and abiding significance, thus making it a revelation of imperishable ideals.

We are told in the first chapters of Genesis that in paradise God commanded man to work, to drudge, to keep the garden, and this labor was a privilege, a blessing. When driven out of Eden in malediction, man was told that thenceforth he must eat his bread in the sweat of his brow, and that the acre would be cursed with thorns and thistles.

Labor that is cheerfully, freely, faithfully done, ever transforms the environment into a paradise.

Labor that is cheerlessly, reluctantly performed, makes of the field a place of thorne and thistles; a place of sorrow and of curses.

CHICAGO DENTAL SOCIETY.

A regular meeting was held November 20, 1917, with the President, DR. P. B. D. IDLER, in the Chair.

Dr. J. E. H. Atkeisson read a paper entitled "Administration of Nitrous Oxid for Dental Operations."

Dr. P. G. Puterbaugh, followed with a paper entitled "Indications and Practical Application of Local Anesthesia in Dentistry."

DISCUSSION.

DR. LOUIS SCHULTZ:

Mr. President and Members of the Chicago Dental Society: First, let me compliment both essayists on the papers they have presented to the society tonight. Both of them are splendid papers. They are timely and well written. There are just a few points I wish to emphasize in a little different manner than the essayists have done.

So far as Dr. Atkeisson's paper is concerned, I agree fully with him with reference to nitrous oxid and oxygen anesthesia. I also agree with him in regard to analgesia. If all of us can grasp the meaning of his statement when he said that it is necessary for a man in handling this drug to have experience, and lots of it, and be careful in the manipulation or administration of it, it will be a big lesson in itself.

Dr. Atkeisson has spoken of the virtues of nitrous oxid and he did so I think with the idea of making a comparison of it with ether and chloroform. He has told us that nitrous oxid is much better for the average patient than other anesthetics, and he enumerated some of the advantages of nitrous oxid over ether and chloroform. Another advantage is that while ether and chloroform are both solvents of lipoids, which are found in most proteid substances, nitrous oxid is not, and on account of that fact nitrous oxid is safer as an anesthetic, even though its administration may be prolonged. We do not have changes taking place in the blood or degeneration occurring in the liver, the spleen, the kidneys, and so on, as we do after ether anesthesia, and still more so after the administration of chloroform. This also accounts for the fact that a patient undergoing a nitrous oxid anesthesia retains his immunity to disease which a patient does not retain who has had either an ether anesthesia or a chloroform narcosis.

The point Dr. Atkeisson made with regard to pink anesthesia is certainly well taken. I know that there are textbooks today which teach that a patient is in the right condition to operate when he is cyanotic. In the light of our present knowledge we know that is wrong. A patient is in the worst kind of condition to be operated on when he is asphyxiated or when he is cyanotic. The principal thing I wish to watch in giving a nitrous oxid anesthesia is the color of the patient, and that should never vary from a pink color. The pink anesthesia Dr. Atkeisson spoke of is the right type of anesthesia the patient should have when he has nitrous oxid administered to him.

With reference to the paper of Dr. Puterbaugh, I believe he had in mind the requirements or principles laid down by Braun who really evolved local anesthesia and put it on the plane it is today. Up to the time of Braun local anesthesia was in a state of rudimentary development. Braun developed it. He made it what it is today, so that major operations can be safely and painlessly performed under the influence of a good local anesthetic. The principles laid down by Braun in the selection of an ideal local anesthetic are four. First, it should be less toxic than cocain. Second, it should be freely soluble in water; and the solution easily sterilizable by boiling. Third, the solution should permit combination with the extracts of the suprarenal glands without deterioration of either one of the agents. And fourth, it should be harmless to the tissues into which it is injected. Now, novocain fulfills all four requirements, and I am glad Dr. Puterbaugh brought out all these advantages of the local anesthetic. He has done more than that. He has brought out two other principles which stand out just as prominently as the four enunciated by Braun, and which I always emphasize in teaching this subject. He has brought out the fact that (Fifth) novocain is non-habit forming, and (Sixth) that it is just as potent an anesthetic as cocain. I simply mention these things to show what characteristics an ideal local anesthetic should possess.

Dr. Puterbaugh made the statement that for conductive anesthesia of the mandible and for the posterior superior alveolar branches a two per cent solution should be used rather than a one per cent. I would take the stand that it does not matter very much as to the percentage of the solution you use, but it does matter how near you get to the nerve trunk that you wish to anesthetize. Of

course, the quantity of the solution has something to do with it, but I do not think he mentioned that phase of the subject. I would say that for conductive mandibular anesthesia from three to four c. c. of a one per cent. solution is absolutely effective if placed right.

The essayist spoke about the toxicity of suprarenin. He has told us about the toxic symptoms of suprarenin, and he has advised slow injection which is proper. Slow injection should always be used, and rapid injection is to be condemned in every case. However, there is more to it than just the slow injection. The quantity of suprarenin in our solution is of prime importance, and is just as important if not more so, than slow injection. There are a number of these novocain-suprarenin tablets on the market containing a high percentage of suprarenin. A percentage of suprarenin which is greater than one in 80,000 or one in 100,000 is too great for the average case. I would prefer to use a percentage of one to 100,000 rather than two in 100,000. I think that if we regulate our suprarenin or adrenalin quantity we will be safe and we will not have the toxic symptoms that have been described by Dr. Puterbaugh; we will reap the benefits of the drug and have none of the bad effects, because we do not inject enough about the tracts of nerves to get that action from it. A great many times untoward symptoms or bad symptoms which appeared at the time of injection or shortly after it, have been attributed to novocain when really the fault was with the high percentage of suprarenin, and not with the novocain.

So far as sterilization is concerned, Dr. Puterbaugh said that the solution would keep for a few days only. That probably is true. Personally I do not keep the solution for a few days; I do not even keep it for a few hours. I usually have the normal salt solution prepared fresh in the morning and use from that solution whatever I need during the day, preparing a sufficient amount for each case as it comes in. I can judge pretty well how much I will be likely to need in a given case, and I prepare that much solution, and if any of it is left it is thrown away. Any of the solution I have used on one patient is not used on the next one. I simply discard it. For the purpose of safety, I think possibly that is the best course to pursue.

So far as hot or cold solutions are concerned for injection purposes, the essayist is right when he says that warm solutions only should be used. A cold solution is detrimental to the tissues. The same might be said of a hot solution. If you wish to inject three

or four c. c. of solution, and have a syringe large enough to hold that quantity, you will find that by filling it as soon as the solution is boiled, its temperature will be too high to inject, so it had better be cooled to body temperature and then injected. Hot and cold solutions are both to be condemned.

Another point I wish to touch on briefly is the matter of time required for a successful novocain anesthesia. There are two factors connected with that. First, the action of the drug itself, which needs more time than cocain because it does not act as rapidly as this latter drug, and second, the location of the nerve trunk you wish to reach in conductive anesthesia. The closer you get to the nerve trunk with your needle, the quicker will anesthesia ensue, and the farther away you are from the nerve trunk that you wish to inject, the longer will it take for anesthesia to take place. If in producing mandibular nerve block, an injection has been made, and it takes three minutes for the tingling of the lower lip and side of the tongue to appear, twenty minutes should be the period of waiting before the operation is done if you wish to begin when the deepest phase of anesthesia has appeared.

So far as upper jaw innervation is concerned, if the injection has been placed close to the nerve, ten minutes is all that is required for any of the upper nerve trunks, including the posterior superior alveolar nerve. Ten minutes is sufficient with 1 c. c. of a one per cent. solution.

With reference to anesthetizing of abscesses for the purpose of incising them, I believe I would prefer to make the injections around that area into normal tissue rather than over it, if I wished to use novocain. To attempt to inject over it is at best a dangerous procedure. I would rather make the injection on either side, blocking the nerve filaments, and then make an incision as it should be made, and make it with perfect safety and without pain to the patient. However, conductive anesthesia is to be preferred in cases of that kind to the infiltration method. One of the principal advantages of conductive anesthesia lies in the fact that you can anesthetize the tissues to be operated on at a point far distant from the field of infection and you do not run any risk of getting in an infected area. I prefer that wherever possible.

So far as the territory is concerned in which infiltration anesthesia may be used successfully, there are a few minor differences in

our methods. For instance, I have no trouble at all in extracting any of the upper teeth by means of infiltration anesthesia. The upper jaw is full of foramina, and by placing the solution between the periosteum and bone, it will find its way into the foramina and anesthetize the jaw promptly and thoroughly, so that the teeth can be extracted without pain. And as to lower incisors, if all are to be extracted, one can give two injections, one in each mental foramen on either side, anesthetize the anterior portion of the lower jaw, and take out everything up to and including the first bicuspid if necessary.

Dr. Puterbaugh has referred to afterpain and soreness and has given us valuable information in regard to the causes which may produce these symptoms, and I would like to speak briefly of the things that cause such symptoms. The point he has made is that you should use freshly distilled water; tap water is no good. Any other kind of water is no good. Long standing distilled water is no good, and indifferently distilled water is no good. It should be used long before that flocculent mass appears in the bottom of the container.

Another reason for this afterpain consists in keeping the solution too long, using it perhaps from day to day, which is very productive of that sort of thing. The solution becomes deteriorated by age, and especially is this true of suprarenin when present because when this drug deteriorates it is likely to give rise to severe toxic symptoms while the organic extract of the adrenal gland does not. Lack of asepsis, such as dirty hands, a dirty syringe, a dirty field of operation, any infraction of the rules that have been laid down for this work, may cause soreness and afterpain.

When I read Dr. Puterbaugh's paper for the purpose of getting ready for this discussion, I could not help but feel that he was writing the obsequies of an old friend that we have had for a number of years, but a friend that either is passing away or has passed away. For after all of what benefit is a discussion of novocain and suprarenin when the supply is shut off? What good does it do to discuss it when we cannot get it any more? However I may say that local anesthesia will not die out with the inability to obtain novocain. I do not know where we are going to get any more novocain unless the conditions of the world are changed. But we will have local anesthesia just the same, and when I make this statement I refer to

a drug that has been put through all the experimental stages and is now on the market and in use. I refer to the drug called Apotherine. It is similar in its behavior and in its action to novocain. It is a little quicker perhaps in its action and gives as perfect anesthesia as the other. This drug can be bought in tablets of different strengths and can be used with adrenalin or without it. It can be dissolved either in Ringer's solution or in normal salt solution, and if necessary the desired amount of adrenalin may be added at the time the solution is made. This will give us just as good, if not better, results than we have obtained in the past from novocain. I thank you.

DR. JOHN E. NYMAN:

I have been much interested in these papers that have been presented by Dr. Atkeisson and Dr. Puterbaugh. First, I want to correct an erroneous impression that was left by the last speaker. Just as soon as the government requirements for novocain have been met, we will be able to get novocain as we did before the war, and for less money than we have ever paid for it before. (Applause.)

Dr. Atkeisson has pointed out very clearly that the border line between analgesia and anesthesia is very difficult to determine and difficult to maintain, the maintenance of an ideal analgesia depends altogether too much upon the cooperative action of the patient himself, while in conductive anesthesia once you have made the injection at the proper point, there is nothing from that time on that the patient can do to defeat the purposes to establish anesthesia. Your anesthesia will be complete. You can put that patient in any position you like. You can stand him on his feet or his head in order to operate to the best advantage. Both Dr. Puterbaugh and Dr. Schultz have emphasized that point.

I differ a great deal with Dr. Puterbaugh and also with Dr. Schultz as regards the injection in opening large abscesses, especially those which point under the palate. That is one place where we still have a use for nitrous oxid and oxygen anesthesia and analgesia. It is exactly for those cases, such as opening large abscesses just for drainage purposes, that today I am still using nitrous oxid and oxygen anesthesia and analgesia. The most tragic results that have occurred in conductive anesthesia have been due to the fact that some men not thoroughly trained in aseptic surgical technic, not thoroughly trained in conductive and infiltration anesthesia, have attempted to anesthetize an abscess area for the purpose of opening

the abscess. The tissue immediately over the abscess is the most sensitive point of all tissues around there. It is the place under greatest pressure. It is a place where there is the greatest amount of toxemia, and it is much safer, as Dr. Schultz suggested, to do conductive anesthesia there by injections at a remote point. In the palate infections you cannot do an ideal infiltration anesthesia because the area is more or less painful on account of the dense tissues that exist in the palate. In those cases nitrous oxid and oxygen anesthesia is best for the purpose of opening the abscess.

I have had experience with these anesthetics myself. I am not talking from theory or from what I have read in textbooks about them or from what experience I have had in operating upon other people I have submitted to the different kinds of anesthetics myself. Invariably I develop an anesthetic agitans when I get into the analgesic state, so that I am utterly insensible to pain, although slightly conscious. I slip over into the anesthetic phase easily. When I am in the analgesic state I have such an uncomfortable pounding in my head that the administration of the anesthetic has had to be stopped on account of this very distressing sensation. That is true of many patients. I know it is true because patients for whom I have induced analgesia with nitrous oxid and oxygen, very intelligent patients, have told me so, and after subsequently using conductive anesthesia on these patients they have said to me, "Doctor, I much prefer conductive anesthesia from this time on."

Dr. Puterbaugh and Dr. Schultz have both referred to the method of injection of the anesthetic solution, saying that it must be injected slowly, and one of the reasons why patients have such unpleasant symptoms following infiltration anesthesia is because the solution is injected too rapidly and forcibly. I find such unpleasant symptoms following infiltration anesthesia in nine times to one of conductive anesthesia. These symptoms are due to the fact that in infiltration anesthesia so much force is used in giving the injection that the anesthetic solution is driven into the venous circulation and you get almost an immediate reaction from the suprarenin content. The patient quickly becomes ischemic and passes into a tonic spasm and alarms the operator and his assistant. As a rule, patients recover quickly from that condition.

There are one or two cases on record of death immediately following novocain conductive anesthesia in which the suprarenin con-

tent was used also. Novocain never kills immediately; it never kills with tonic spasm, and these deaths, every one of them, have been reported as cases in which tonic spasm has occurred and death almost immediately. Novocain kills by paralyzing the respiratory centers or by interference with cardiac action. That has been clearly demonstrated by two investigators, Roth and Levy, in a series of experiments, so that if any one reads their reports he will not have the faintest shadow of a doubt about them.

As to unpleasant reactions in certain patients following the initial injection of the ordinary 2% novocain-suprarenin solution, I have varied the injections for the sake of comparison. I at a later time injected these patients again with a solution which contained the same amount of novocain, but only one-half the content of suprarenin, and had absolutely no reaction at all. I did this in the cases of two friends who were men of courage and had confidence in me. They submitted to a third injection which was similar to the first injection and the same reaction resulted as the first time. That proves to me conclusively that these immediate reactions we get are due to the suprarenin content. Individuals vary as to the amount of suprarenin they will tolerate. They are not placed in any danger, but it causes a distressing reaction which leads them to have a dread of conductive anesthesia and this makes the operator apprehensive, too.

There have been various cases in which coincident disturbance have occurred not due to the effects of novocain. I have had four in my own practice. These would have been ascribed to novocain. Each patient had an appointment with me to have conductive anesthesia by novocain. For various reasons they were unable to keep their appointments. What happened? One man in the evening of the day he was to have come to my office for conductive anesthesia developed a terrific epistaxis. He had to be taken to a hospital and have his nostrils packed. The packing had to remain for four days. If I had injected that individual the epistaxis would have occurred, and it would have been ascribed to the novocain solution. There was another case that developed quinsy the next day, and still another in two days developed an attack of mumps. Another case developed facial paralysis which persisted for three months. In neither of these cases was any injection employed at all. We contemplated doing it and had made appointments to do so.

One of the most striking instances was recently brought to my attention. A man suffering from myocarditis and joint rheumatism was known to have a lot of bad teeth. An appointment was made to go to this man's home and give him conductive anesthesia for the purpose of removing these bad teeth as the doctor felt it would not be safe to give nitrous oxid. The man who was to inject the anesthetic solution and operate in that case was delayed 15 minutes in getting to the home of the patient. When he arrived there he found the members of the family in great confusion. The man had died five minutes before the dentist arrived at the house. The patient had suddenly complained of a feeling of oppression with pains in his arms which radiated down to the finger tips, and shortly passed away in an attack of angina pectoris. If the doctor had gotten there at the appointed time and had given that man an injection of novocain, the angina would have occurred just the same and the death would have been ascribed to the novocain just as surely as I am standing here.

With reference to the needles which are to be used for the injection, we employ nothing but iridio-platinum needles. These can be completely sterilized with no danger of oxids forming on the metal which may liberate metallic poisons in the tissues of the jaw. We do not employ tincture of iodine for sterilizing tissue because it deteriorates, forming hydriodic acid which is a caustic and produces surface burns. The sloughing you get, as a rule, I do not believe is due to the pressure used in making the injection, but it is more apt to be due to a deterioration of the suprarenin content or to the deteriorated novocain content. It has been my observation that where deteriorated suprarenin is used you get a form of tissue necrosis that is much like the necrosis we observed in the old times when injections were made of solutions of chloral. For sterilizing and for preliminary anesthesia of the tissues prior to injection, we now use a solution composed of menthol, one gramme; iodine, one gram, and benzol, 25 c. c. With that we get a solution that is absolutely stable. The tissues must be dried off with cotton prior to the application of this because it does not fix the saliva of the mouth as tincture of iodine will. The antiseptic is dried off and a refrigerant surface anesthesia is obtained.

As regards patients who are highly nervous, they are the class I have had ~~most~~ unsatisfactory results with in attempting to obtain

nitrous oxid anesthesia and analgesia, and I believe that conductive anesthesia is the method par excellence for these highly nervous patients.

There are two ways by which you can control a highly nervous patient, one of which is to give a hypnotic before hand like veronal, which is the best hypnotic of them all. Give the patient 5 to 10 grains about twenty minutes before you make the injection, or to give the patient a mild narcotic like codeine sulph $\frac{1}{2}$ grain.

Furthermore, those who are practicing anesthesia must learn to acquire two things that an old teacher of mine, Dr. Charles Parkes, once Professor of Surgery in Rush Medical College, used to impress upon us, namely, in the practice of anesthesia or surgery you must cultivate the surgical temperament and cultivate the aseptic habit. These two things apply to anybody who attempts to do conductive anesthesia. He must make a very thorough study of the patient he has to deal with. If he has an excitable or nervous patient, it makes the injection all the more difficult. The operator should go at his work calmly, and if he has a highly nervous patient to deal with, he should give that patient as suggested a hypnotic or a mild narcotic, and then he will have no trouble with his anesthesia if he makes the proper injection.

Another point: don't attempt to carry on conductive anesthesia until you are properly trained to do so. It is well to read and become familiar with the literature and see others use it or demonstrate it before attempting it yourself. That will give you a good preliminary idea of what can be done, but if you practice it without being instructed by men of experience your results will be unsatisfactory. Conductive anesthesia, when properly administered, is one of the greatest boons that science and invention have ever brought to the doctor and patient.

DR. ARTHUR E. SMITH:

Mr. President and Members of the Chicago Dental Society: It gives me great pleasure to enter into the discussion of the papers on general and local anesthesia by Doctors Puterbaugh and Atkeisson. Within the last forty-eight hours I have personally experienced nerve blocking for the removal of tonsils, and I can assure you that the results were very gratifying.

I am very glad of having had the privilege of carrying out considerable work with nitrous oxid-oxygen anesthesia and anal-

gesia for some time in the past. I have been asked many times why it is that I am using nerve blocking so extensively when I used to advocate nitrous oxid-oxygen so strongly. My reply has been this, that any anesthetic that relieves pain is certainly worthy of our careful consideration and study. I do not think any anesthetist would tell you that nitrous oxid-oxygen is the only anesthetic any more than he would say that ether and chloroform are the only anesthetics or nerve blocking or any of them. We should carefully select the anesthetic we employ and if need be a combination of methods and not expect ideal results with routine cases through the medium of any single anesthetic agent. The work that has been done along this line by Crile is really a revelation. He uses nitrous oxid-oxygen in nearly all his cases, and not only that, he employs nerve blocking as well. He has carefully worked out a technique known as anoci-association and the results of this technique have attracted the attention of surgeons all over the world. He has reduced the mortality rate to a degree one would hardly believe.

I agree with both essayists and those who have discussed the papers in saying that general and local anesthesia is a science that requires careful thought, consideration and study. A high degree of skill is not only necessary in administering nitrous oxid-oxygen but in nerve blocking as well. Why is it that so many nitrous oxid machines are discarded? You will see a large number of them pushed back into the corners of offices. Why is it that so many dentists have stopped using this most efficient pain relieving agent? I think that you will agree with me when I say in the majority of cases it has been due to a lack of confidence and skill on the part of the operator to administer the gases in a scientific manner. It is also true that many dentists treated the matter as a mere fad. Nitrous oxid-oxygen is by far the most difficult anesthetic to administer properly, but when we consider its nil effects, absence of post-operative complications which are so often encountered with ether and chloroform it is most gratifying to the surgeon, anesthetist and patient. This form of anesthesia when administered by one trained in its scientific application has no equal as a general anesthetic and the failure encountered by those not mastering its proper application

should in no way discourage the modern trend for the anesthetist who applies himself.

One of the essayists—I think it was Dr. Atkeisson, stated it was not possible to obtain relaxation of the muscles under nitrous oxid-oxygen anesthesia for surgery. I can verify his statement when this agent alone is employed. It is not possible to secure relaxation in all cases, but if the anoci-association method is employed as advocated by Crile one can obtain thorough relaxation. In all cases this relaxation is not obtained through the medium of nitrous oxid-oxygen alone but through the medium of a combination of methods, such as the employment of a preliminary sedative, plus nitrous oxid-oxygen anesthesia, plus nerve blocking. In other words a combination of nerve blocking, a preliminary sedative, and nitrous oxid-oxygen anesthesia renders the parts relaxed and at the same time the blocking of the afferent impulses generated at the site of operation are completely blocked.

I have had the pleasure of observing the work and studying the results of Dr. Crile and it is really wonderful. The relaxation is of such a degree that any operation can be performed on the deep viscera without any inconvenience to the surgeon. With reference to discouraging the promiscuous use of secret formulae local anesthetics I do not see why any dentist should obtain such preparations and inject them into his patients when he has at his command those ingredients which are recognized by the medical and dental professions and those who have spent much time in research and study on the subject. Those preparations, measuring up to a high standard of efficiency and of least toxicity, should only be employed. The conscientious practitioner will not inject any preparation into a patient without knowing its constituents and toxicity. You would not find the modern physician administering compounds without knowing their action and composition.

It has been my privilege to experience nerve blocking in my own case a number of times, and only recently for the removal of tonsils, and I wish to emphasize the importance of injecting the solution slowly. When the nerve supply to my tonsils was blocked, the solution was injected too rapidly and considerable pain was experienced during the ~~discharging~~ of the

solution from the syringe. Sufficient time should always be allowed in order to give the tissue in the immediate vicinity of the needle point ample time to adjust itself to the new order of things. If the solution is injected too rapidly the patient in most cases will encounter pain, not only at the time of the injection, but a slight amount of trauma is produced, which produces post-operative pain. Nerve blocking injections can be made with practically no pain to the patient if the operator is skillful with his technique. Those of you who have experienced nerve blocking injections I am quite sure appreciated the ease of application with the slow injection of the solution.

The time to wait for anesthesia depends upon three factors, which are: The strength of the solution injected, the skill of the operator in being able to inject the solution near the nerve trunk, and the diameter of the nerve trunk to be blocked. These important factors govern the time to wait for anesthesia and the failure of any one of them spells failure for the operator. If we are blocking the second division of the fifth nerve posterior lateral to the superior maxillary bone, or blocking the inferior division of the fifth nerve as it emerges from the foramen ovale we could not expect anesthesia as quickly as following the blocking of smaller nerve branches, therefore sufficient time should be allowed for the anesthetic solution to permeate the larger nerve trunks in order to obtain a complete block of the operative field supplied by that particular nerve branch.

I heartily agree with Dr. Nyman in saying that infiltration anesthesia produces more toxic symptoms and unpleasant effects than the deep nerve blocking injections. The blocking of the middle superior alveolar nerve which is given off the second division from the infra-orbital branch of the fifth nerve has given me more trouble than all the other injections put together. The middle superior alveolar nerve is covered by the outer bony wall covering the external or outer surface of the antrum. I have failed many times in anesthetizing the upper two bicuspids and first molar. When I speak of anesthesia, I mean anesthesia, and not an analgesia. Some operators inject a solution around the tooth and produce good analgesia, and then extract the tooth and if the patient experiences pain at the moment of extraction they think that ~~perfect~~ results were obtained. When I say anesthesia

I mean anesthesia which will permit the removal of a pulp, the preparation of a hyper-sensitive gingival cavity, root amputation or any other operative work necessary without the slightest pain to the patient.

In the last few months I have taken up intra-osseous anesthesia for these three teeth, that is, the upper first molar and two bicuspid. This method has given me a great deal of satisfaction and really fills in the missing link in nerve blocking. Not only is the intra-osseous method of anesthesia of great advantage, for operative work or for the removal of these teeth, but also for blocking the nerve supply to other teeth. If the case is for the extraction for all teeth two deep injections are made, thus blocking the posterior superior alveolar nerve on each side and an intra-osseous injection distal and above the apex of the cuspid tooth on each side of the arch. These four injections are sufficient to anesthetize sixteen teeth for pulp removal, cavity preparation or apiectomy. If the teeth are to be extracted or any operation performed which involves the lingual surface then the anterior and naso-palatine branches are blocked. This eliminates the two infra-orbital injections and the two infiltration injections over the upper first molar and bicuspid and a less quantity of solution is required. With the intra-osseous technique I follow there is no destruction, trauma or laceration to the tissue and a known amount of solution is injected.

I would like to take this opportunity in saying something with reference to nerve blocking for tonsillectomy. It has been my pleasure to work on the technique for blocking the tonsils on cadavers as well as collaborating with several eye, ear, nose and throat specialists in this work and the results have been very gratifying. This is in reference to nerve blocking injections instead of infiltration anesthesia as being employed by many of the throat specialists. The tonsils are supplied from two different sources. Their nerve supply is derived from the tonsillar plexus, which is made up of nerve fibres coming from the pharyngeal plexus and glosso-pharyngeal nerve, also the middle and posterior palatine nerve branches which are given off from Meckel's ganglion in the sphenomaxillary fossa. Two injections are all that are necessary for blocking the tonsils. One injection will block the posterior and middle palatine branches. A needle

with a certain degree of curvature is employed for the injection. The tonsillar plexus is located at the posterior-lateral base of the tonsil and that plexus is blocked by using a straight needle mounted on an extension shank on the syringe. The puncture of the tissue is made beneath the plica semilunaris. The depth to insert the needle for the two injections depends on the individual patient. There is no question but what the nerve blocking method is superior to the infiltration method employed for blocking the tonsils. By the filtration method the needle is inserted promiscuously a number of times in the tonsillar tissue, anterior and posterior pillars, and by so doing many times disseminates infection. Many tonsils are found broken down, contain necrotic material, pus, etc., and the physician is doing what the dentist would not do in dentistry, that is, insert the needle into an abscessed area and distend the tissue with an anesthetic solution, thereby forcing pus or necrotic material into the surrounding healthy tissue.

Many of the operations which the dental practitioner is called upon to perform cause excruciating pain and I fully believe that we are always justified in relieving our patients, which will not only be appreciated by them but enables us to render better service, and last but not least, it elevates our profession. A pain relieving agent should be used only with thought and judgment, and the general practice of promiscuously injecting a local anesthetic or the administering of a general anesthetic is unwarranted. This subject should not be treated as a mere fad, and the conscientious dentist will employ these agents only when they are really indicated. Pain relieving agents have their place in modern dental practice, just the same as other phases of dentistry, and if the dental practitioner employs anesthesia intelligently it is of value to the operator and the appreciation of the patient is immeasurable. Anoci-association is applicable to dental practice to a certain extent and it is true that many factors enter into its employment. Nerve blocking properly executed and combined with the other factors which I will not take time to discuss is certainly invaluable to every practicing dentist. Nerve blocking, as well as the other methods used for producing local anesthesia, demand certain well defined technique and the same careful consideration as other scientific subjects. One can-

not hope to become master of the art with only a limited experience. Local anesthesia obliterates traumatic shock but does not eliminate the psychic phenomena and it therefore behooves the operator to be tactful with his *modus operandi*. If the operator is tactful and masterful of the situation the psychic influence will be a minor factor. With certain individuals an operation for oral surgery, the combining of nitrous oxid-oxygen and nerve blocking anesthesia is of advantage.

With reference to the possibility of the death of pulps when anesthesia is employed, I wish to say that I fully realize that there possibly will be dead pulps resulting from the indiscriminate use of nerve blocking or from any other method used for eliminating pain. It is true that when the patient is free from pain, the most careful operator will expose a pulp occasionally, but that should not prevent us from rendering service free from pain. If the operator is thoroughly familiar with the anatomy of the tooth, taking into consideration the age of the patient, the amount of recession of the pulp, I think that the trouble will be minimized to a great extent.

One of the keynotes to success in nerve blocking is to deposit the solution near the nerve branch supplying the area of operation, then it is imperative that an accurate knowledge of anatomy is necessary for rational procedure. When the technique for nerve blocking is mastered the various nerve trunks and their communicating branches supplying the various structures of the jaws can be blocked. In nerve blocking and terminal anesthesia the patient is conscious, can prevent the inspiration of blood and mucous and can assist with the operation. Not only is local anesthesia of immeasurable value in various cases of operative dentistry, but for other operations as well, such as the resection of the alveolar process or jaw, treatment of the trifacial neuralgia, the removal of the impacted third molar, which we are many times greatly handicapped in removing under a general anesthetic. It can be removed under nerve blocking anesthesia with the co-operation of the patient and an anesthesia lasting in accordance to the amount of vaso-constricting agent injected with the anesthetizing solution. Nerve blocking in cases of fractures of the jaw is of great value and I am quite sure this method will prove of great value to the dental and oral surgeons in the treatment of the wounded in the

war in Europe. Complete apposition of the bones can be secured and splints adjusted, thus giving plenty of time for this procedure and with the co-operation of the patient.

In closing, allow me to say that the technique for nerve blocking in all of its phases must be mastered in order to obtain the best results, and a strict adherence to dosage, isotonia and sterility of the injecting solution must be observed, and last but not least strict asepsis must be carried out at all times. To those of you who are taking up nerve blocking I can assure you that it will prove one of the most beneficial steps you have ever taken for the advancement of dentistry in being able to carry on dental operations without inflicting pain.

DR. ATKEISSON (closing on his part):

Both Dr. Schultz and Dr. Smith mentioned apparatus and the fact that many apparatus have been discarded. I want to say to you, gentlemen, there has never been and never will be an apparatus manufacturer for the administration of any kind of anesthetic, it makes no difference what it is or what it will be, that has brains and will do the work that you have got to do. (Applause.) The ideal anesthetic is not yet known. Possibly the nearest approach to it is anoci-association.

Dr. Smith mentioned muscular rigidity. With straight nitrous oxid and oxygen the tenacity of the muscles is maintained, especially if the operator in doing abdominal or pelvic surgery, and it becomes necessary to administer in these cases sometimes a very small quantity of ether, or at other times a larger quantity. I have maintained the anesthetic effect with nitrous oxid and oxygen for one hour, with the addition of one-half ounce of ether. I have given some anesthetics during which it has become necessary to give two or three ounces of ether. All of these patients must be prepared (I am speaking now of surgical cases, not dental), with a preliminary narcotic.

In closing, I wish to say that a meeting of this kind is very refreshing. I like to be criticized. I don't care if you shoot me full of holes, I will try and do better work, and all of you will do the same.

I have learned something about nerve blocking to-night. I have done some of it, and that is the slow infiltration or slow injection of the anesthetic fluid. I am going to try it. I have had some of it

done on myself, and have experienced soreness and sickness that lasted for two or three days; but I am positive of one thing, that it was not due to any faulty technic or asepsis in this particular case.

In preparing novocain solution and using freshly distilled water, I would like to ask whether in the mixing of the solution any of the gentlemen have noticed a pink color of the solution.

I have witnessed two deaths as a result of spinal anesthesia with novocain. Dr. Nyman mentioned the fact that these patients die in tonic convulsions. These two patients that died were selected cases for spinal anesthesia, and both died of respiratory paralysis, one an hour and a half after the injection, and the other, three hours. Artificial respiration was instituted and maintained in both of these cases for about an hour and a half, but the heart ceased to beat and we were not able to resuscitate them.

DR. PUTERBAUGH (closing):

I am pleased with the free discussion that has been brought out on the subject of local anesthesia. In my paper I only tried to point out a few principles which I believe are fundamental in the practice of conductive anesthesia. I did not take up the quantities of solution or points of injection because I expected to do that in connection with the lantern slides.

Practically all of the technic that is employed to-day was brought out by Fischer a number of years ago, and Fischer followed that master of local anesthesia (Braun), as referred to by Dr. Schultz.

As to the drawing of the freshly boiled solution into the syringe, I will say this: If you remove the needle from the hypodermic syringe and draw the solution in, it will be too hot to inject into the tissue; but if you draw the solution up through the needle, it will cool, and in injecting it you will find that it will be about the right temperature.

As to the supply of novocain which was mentioned by Dr. Nyman, you can purchase novocain from the dental supply houses of this city. These supply houses promise us that within the next few weeks American novocain will be on the market.

As to the use of local anesthetic agents, you may use any agent. You may use cocain or cocain substitutes, but the principles I have tried to outline should be followed in the injection of any local anesthetic agent.

Dr. Smith said that he has had some trouble in the anesthetization of the deeper bicuspid. In anesthetizing the upper bicuspid for cavity preparation or pulp removal or for extraction of teeth, I have made it a practice to insert the needle near the apex of the root, where the buccal mucosa is reflected from the alveolar process, inserting the needle with the beveled side in, next to the process and right under the periosteum, making a subperiosteal injection. I have had no difficulty with that type of injection. The places where I have had difficulty with infiltrative anesthesia has been on lower molars and bicuspid. I do not get complete anesthesia here unless I use the conductive type of injection, 2 c. c. of a two per cent solution of novocain, in the region of the mandibular foramen.

The points brought out with reference to having a thorough knowledge of the anatomy and of knowing where to inject the various nerves are well taken. These things we must master by practice and experience, but a little practice will enable you to obtain good results.



THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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WORK FOR THE FOLLOWING BILL IN CONGRESS.

The following Bill explains itself and we commend it strongly to the consideration of our readers:

S. 3386.

IN THE SENATE OF THE UNITED STATES.

January 5, 1918.

Mr. Lodge introduced the following bill; which was read twice and referred to the Committee on Naval Affairs.

A BILL

To provide for commissioned officers of the Dental Corps of the Navy the same rank, pay, promotions, and allowances of officers of corresponding grades in the Naval Medical Corps, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Dental Corps of the Navy shall consist of commissioned officers of the same grades and proportionally distributed among such grades as are now or may be hereafter provided by law for the Medical Corps, who shall have the rank, pay, promotions, and allowances of officers of corresponding grades in the Medical Corps, including the right to retirement as in the case of other officers, and there shall be one dental officer for every thousand of the total strength of the Navy and Marine Corps authorized from time to time by law: Provided, That dental examining boards shall consist of one officer of the Medical Corps and two officers of the Dental Corps: Provided further,

That immediately following the approval of this Act all members of the Dental Corps now in active service shall be recommissioned in the Dental Corps in the grades herein authorized in the order of their seniority and without loss of pay, rank, allowances, or precedence in the Navy: *And provided further*, That nothing in this Act shall be construed as in any way affecting the original appointment of officers to the Dental Corps as provided in the "Act approved August twenty-ninth, nineteen hundred and sixteen, making appropriations for the naval service for the fiscal year ending June thirtieth, nineteen hundred and seventeen, and for other purposes: *And provided further*, That when ordered to active duty officers of the Dental Reserve Corps shall receive promotion in rank under the same relative conditions and provisions of active service as is provided in this Act for the Navy Dental Corps."

Recent legislation at Washington has been so favorable to the interests of the present wards of the Government—the U. S. Army—so far as dental service is concerned that it would seem only logical for the present Bill to pass without difficulty. If good service is needed in the Army it is assuredly needed to an equal degree in the Navy, and now is the time to secure it. But no legislation can be passed at Washington in the present unsettled state of affairs when so much is claiming the attention of Congress without strong influence being brought to bear on our legislators. Quite naturally they must be shown conclusively the necessity of any legislation to be passed today. What the members of our profession must do is to communicate with their Senators and Congressmen and call their attention to the urgency of passing this Bill. Do this at once. Either write or telegraph your Representatives at Washington urging them to support Senate Bill 3386, and make the appeal short and strong. The dental profession has long since learned the value of organization in movements of this kind, and this is a time when all our organized forces should be concentrated on the passage of this measure.

RETAIN THE DECIDUOUS MOLARS.

Attention has frequently been called to the necessity of preserving the deciduous teeth till the time for the appearance of the permanent set and in no instance is this more important than in the case of the deciduous molars. Too frequently these teeth are extracted

because of minor trouble which might readily be remedied by a little careful attention. In the minds of many dentists and of most patients there seems to be the sole idea of relieving the child of present disability without thought of the permanent injury which may result. It is not only the matter of impairing the mastication for the time being by the extraction of these teeth but of the far greater injury in an entirely different direction. Orthodontists have repeatedly called attention to the serious disarrangement of articulation in the permanent set by the premature loss of the deciduous teeth, and this is particularly true of the molars. If these teeth are lost long in advance of the eruption of the bicuspid which are to take their place, the first permanent molars, which are usually erupted four or five years before the bicuspid, are almost certain to drift forward and narrow the space intended for the bicuspid. This results in irregularity of the permanent teeth, in some instances to such an extent that the second bicuspid is caught between the first bicuspid and first permanent molar and never allowed to erupt. The havoc wrought in some mouths by the premature loss of even one deciduous molar is so serious that dentists should take great pains to instruct parents on the necessity of saving the teeth of their children.

Ordinarily these teeth are amenable to treatment even after they are decayed sufficiently to involve the pulp, and in many instances even when they have gone further than this and developed an abscess. Usually these abscesses readily yield to treatment, but of course, if they do not the tooth must come out. The chief lesson to learn is that the child's deciduous teeth should be examined regularly and kept in such condition that no abscess develops. The practice of dentistry is becoming more and more a matter of educating the public, and in no department of our service is it quite so important as in the one under consideration.

In those cases where the loss of the deciduous molars seems inevitable on account of long neglect, the case should be referred to an orthodontist to have an appliance adjusted to maintain the normal space till the bicuspid is fully in place. This will usually save the child from much subsequent trouble in having the teeth regulated later in life after irreparable damage has been done.

THE EDITOR'S DESK.

AN OPEN LETTER TO THE YOUNG LADY ASSISTANT.

MY DEAR GIRL:

You have been a saving grace in the practice of dentistry. You have helped to prolong the life of the dentist, and to take the thorns from his pathway. You have been the guardian angel who has stood over him in his darkest hours, and shielded him from the buffets of his patients. You have done more than this—you have added to the efficiency of his service many fold and enabled him to accomplish more for the public. I have long wanted to write you and tell you how much I appreciated what you have done for my fellow practitioners and for me; and now at a time when all the world seems awry, when hate, and strife, and suspicion, and envy, and distrust, and anger seem to dominate mankind, I am going to pause and try to tell you of all the virtues which you have brought to you calling, and the good you have done in your chosen field of work.

No one realizes more than I that at times your position is a difficult one to fill, that you are a buffer between the whimsicalities and sometimes the unreasonableness of patients on the one hand, and the weariness and utter nervous exhaustion of the dentist on the other. You sometimes accept blame when the blame is not yours, and this is a rare virtue. If you do it uncomplainingly you are that much nearer being a saint. Not that I wish to set you up as a saint, for usually you are not—you are just ordinary common clay with some faults and many virtues. And it has been my purpose and pleasure to admire your virtues and forget your faults.

Much has been written as to what your duties and accomplishments should be, and I hope I may be pardoned if I make some suggestions along these lines. Your chief function is to relieve the dentist of many of the small details of conducting a practice and leave his mind and time free to concentrate on the larger and more exacting affairs of the office. In so far as you succeed in doing this you are valuable—insofar as you fail you are lacking in value. To do this you must have initiative, and if there is one limitation in the average young lady assistant it is in this matter of initiative. Too many

are mere automatons, mere routinists, mere imitators. I am not criticizing, I am only stating a fact. Look for yourself, and see.

I may be told that initiative is heaven-born and inherent—that it cannot be acquired. Bosh! Let me tell you what is necessary. Thinking is necessary, concentrating is necessary, observing is necessary. If you have the interests of the office at heart you will think often and seriously as to means of bettering the service, you will concentrate your mind on the affairs of the office, you will be observant at all times of the little amenities of life that go so far toward making matters move smoothly. This is initiative. It is this which makes the young lady assistant indispensable in the conduct of a practice, which binds her to her employer, and makes their interests mutual.

But you cannot acquire this kind of initiative unless your mind is on your work, unless you take a real interest in it. If you are working solely for the salary you receive, or if your mind is more on dances than on dentistry, you will never be anything else than a routinist, and often a poor one at that. Nothing of value was ever obtained without application, and no walk of life was ever properly graced by an individual without enthusiastic interest in the work in hand. If you cannot concentrate on your duties so as to serve the best interests of your employer, then in justice to him and yourself leave him, and go into something else. Maybe you were meant to be an expert dancer.

By all of this I do not mean that you should have no pleasures or diversions. I honestly want to see you have both. No human being should be condemned to a life of monotony or drudgery—least of all a young lady with the qualities necessary to assist in a dental office. But here are two things worthy of consideration—first that there are many diversions other than those which incapacitate you for your work; and second, that if you perform your duties conscientiously and capably you will find much real diversion in the work itself. There is no solace quite so concrete as the satisfaction of having excelled in any service, and I commend this to your most careful consideration.

I do not wish to preach or prate to you about your duty to your employer. What I am most emphasizing is your duty to yourself, whereby you may get the greatest satisfaction out of your daily work. I am deeply interested in your welfare, and I want to

see you attain to the largest measure of happiness and usefulness. As I said at the beginning, you have filled an important and exalted place in the development of dental practice and my desire is that you come fully into your own. I had intended saying something more concrete as to the details of your office duties, but I have drifted away into generalities, and the limits of space will not permit me to write you further at this time. Perhaps I may at a future date.

You have my best wishes, my frankest admiration, and my deepest gratitude.

Sincerely yours,
C. N. J.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Use Cross-cut Inlay Burs:—The cross-cut inlay burs so common in use now will cut reverse as well as forward. Learn to use them both ways and save many slips and retain better control of hand piece.—*Victor H. Fuqua, Chicago.*

Cement Fillings Covered:—I have finished cement fillings in occlusal cavities and smeared them with Guta Percha, and in occlusal cavities and smeared them with Gutta Percha, and in-pick off the Gutta Percha,” and find they had not been able to do so, when they returned a week later. That cement was hard.—*Homer Almon.*

Tempering Small Tools:—Fill the tin top of a catsup bottle with melted beeswax and place conveniently on work bench. When tempering hold instrument—as a chisel—above and near wax; with blow-pipe heat to a dull red and quickly push instrument into the wax. The degree of hardness depends on how rapidly the instrument is pushed into the cold wax.—*J. T. Search, Onarga, Ill.*

For the Relief of Pain:—It frequently happens that extreme

pain follows the extraction of a tooth or root. Almost immediate relief may be given the patient by inserting a pellet of cotton wet with chloroform to the full depth of the root socket and place your finger firmly over the mouth of the socket for from ten to twenty seconds, then remove the cotton from the socket. Repeat if necessary.—*H. A. Cross, Chicago.*

To Test the High Spots:—We often have plates, crowns, inlays, removable bridges and other work which when inserted in the mouth we would like to know just where the high spots are, and as we are not able to see through this work, a good plan is to put a thin layer of very soft wax on the inside of the piece and press gently to place. When you remove it you can tell where the high spot is.—*Y. E. Whitmore, Little Rock, Ark.*

Mental Foramen Mistaken for Alveolar Abscess:—Gray has placed the mental foramen one-fourth inch south of the apex of the second bicuspid, but it does not always stay there. When the professional radiographer shows it to have wandered too near the root end it then becomes a mental foramen abscess or rarefaction and out comes the tooth. Ha! Ha! Serves you right. Why didn't you consult your dentist?—*L. E. Custer, Dayton, Ohio.*

To Hold Cotton Rolls in Place While Operating:—Frequently a cavity may be kept dry long enough for a treatment or an amalgam filling by the use of cotton rolls without the rubber dam. The problem is to keep the rolls in place, particularly in the lower jaw, where the tongue always has a tendency to toss the rolls out of position. This may be obviated by slipping an ordinary rubber dam clamp over the tooth after the rolls are in place allowing the beaks of the clamp to grasp a small portion of the roll between the clamp and the tooth. This will hold the roll securely and will also prevent the clamp from hurting.—*Ed.*

How to Get the Best Results in Casting Watts Metal Plates with Porcelain Teeth:—After the wax model has been properly invested in a casting flask allow the investing material to dry for one hour. Then place it on a low flame for forty-five minutes and on a high flame until the whole investment block is red hot. In or-

der to prevent the checking of teeth that will occur by the different expansion or contraction of Watts Metal and porcelain you have to allow your flask to cool thirty minutes. Melt your Watts metal and pour it in the flask and allow to cool. As I have cast Watts Metal for a good number of years with best results I am positive that some fellow dentist will profit by it.—*John V. Amenta, Chicago, Ill.*

BOOK REVIEWS.

MODERN DENTISTRY. By *Joseph Head, M. D., D. D. S.*, Dentist to the Jefferson Hospital, Philadelphia. Octavo of 374 pages, with 309 illustrations. Philadelphia and London: W. B. Saunders Company, 1917. Cloth, \$5.00 net.

The author of this book is so well known to the profession that any work with his name on the title page will command respect at once. The key-note of the present volume may be given in the following words taken from the preface: "Dentistry, owing to the teachings of Pasteur, has at last awakened to its great responsibility. Henceforth no appliance, however beautiful externally, will be tolerated unless it can be kept absolutely clean and no repair of a tooth or root will be countenanced unless it conforms to the standards of scientific mouth hygiene. Fillings, crowns, and bridges are no longer to be considered mere objects of art for personal adornment or mechanical trituration of food, they must primarily be hygienic."

The wide range of subjects considered may be seen by noting the chapter headings—Causes and Effects of Mouth Infection; Prevention of Mouth Infection; A Study of Tooth Enamel and Saliva; Treatment of Mouth Infection; Treatment of Root Canals; Fillings; Children's Teeth; Crowns; Replacing of Lost Teeth; Experiments Concerning Strength, Solubility, and Adhesionness of Various Cements; and Study of Roots and Gums by means of X-Ray.

The author's treatment of these various subjects is distinctive, emphatic, intelligible, and wholly characteristic. With much that is presented the reviewer can agree, but with some he must take exception. The sweeping reflection on "The Old Hammered Filling"—referring to gold foil, will never stand the test of experience. The most permanent operations that have ever been performed on the human teeth have been made with this same malleted gold foil which the author condemns, and while the limitations of gold foil are well

recognized today they do not lie in the direction indicated by the author, nor is it at all true that "The tooth filled with hammered gold ordinarily begins to decay as soon as the filling is inserted." Such statements as this militate against the value of a work which is calculated to rouse the profession to better effort along many lines of practice. Dr. Head has performed some painstaking and extensive experiments, preparatory to writing this book, on the stress required to break certain filling materials such as porcelain, etc., and on the probable force used in mastication. He has placed the profession under obligation to him for his investigations in various directions, and those who study his writings will receive a broadened point of view. The book mechanically is exquisitely brought out, the paper and press work being of the highest order.

DENTISTRY IN THE BIBLE AND TALMUD. By *Dr. Samuel Greif*, author of "Who's Who in Dentistry." Seventy-two pages. Cloth. Published by Who's Who Dental Publishing Company, New York.

The author explains in the preface to his work that "The contributions of the Talmud to the history of dentistry are entirely new to the English reading public." The references to the teeth from the Bible which are given in the present work constitute less than seven pages and these are claimed to be complete; while the remainder of the work is taken up with "Dentistry in the Talmud." The work is interesting and the references to the teeth are frequently very quaint to the average reader of today. To dentists who are not familiar with the Talmud Dr. Greif's book will appeal as giving them an insight into the character of the great work, which is really an encyclopedia of Jewish learning. We welcome the book into our literature and wish the author success in its distribution.

MEMORANDA.

MONTANA STATE DENTAL SOCIETY.

The fifteenth annual session of the Montana State Dental Society will meet in Butte. The exact date has not yet been determined. R. R. Johnson, Secretary, Great Falls, Mont.

KENTUCKY STATE DENTAL ASSOCIATION.

The next annual meeting of the Kentucky State Dental Association will be held at Lexington, Ky., June 13th, 14th, and 15th, 1918. "An Amalgam Program of Special Interest." Address all correspondence to Dr. W. M. Randall, Secretary, Louisville, Ky.

ANNUAL CONVENTION OF THE TEXAS STATE DENTAL SOCIETY.

The thirty-eighth annual convention of the Texas State Dental Society will be held at San Antonio, Texas, the famous City of the Alamo, April 10th, 11th, and 12th, 1918. Members of other state societies are cordially invited to attend. J. G. Fife, Secretary, 736 Wilson building, Dallas, Texas.

"PROOFS."

This is a new magazine for dental dealers and dental salesmen. It is alive, bright and to the point. It is published in Pittsburgh by Lee S. Smith & Son, and edited by M. B. Massol. The first issue is very attractive and we welcome it into the ranks of dental journalism. There is need of a magazine of this character and we predict success from the start.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Golden Anniversary Meeting of the Pennsylvania State Dental Society will be held in Wilkes Barre, April 23rd, 24th, 25th and 26th, 1918. Excellent talent has been secured for the occasion and the program extended to a four days' session. To judge by preliminary reports of committees, this event promises to be the greatest meeting in the history of this organization. All ethical practitioners are cordially invited to attend. J. F. Biddle, Secretary, 517 Arch St., Pittsburgh, Pa.

AN APPEAL.

Members of our profession in Belgium and part of France have had in most instances their earthly possessions swept away by the exigencies of war, and an organization has been formed to raise funds to aid them till they may once more resume practice. The name of this organization is l'Aide Confraternelle, with headquarters in Paris, American confreres may do themselves honor and aid their brother dentists abroad by contributing liberally to this fund, with the satisfaction of knowing that the money will be well spent. Contributions may be sent to the treasurer, M. Fontanel, 1 Rue Vercingetorix, Paris, France.

DEATH OF DR. JOHN W. DAVID.

Dr. David, of Corsicana, Texas, died of various complications at Dallas, December 29, 1917. He was in his fifty-fourth year. Dr. David was one

of the outstanding men of the South and his death will cause sadness wherever he was known. He had been honored by his profession with many offices, and was always a prominent figure in any gathering of dentists where he was present. The profession can ill afford to lose such men, and it will always hold them in loving memory.

CHICAGO HOSPITAL.

The following circular signed by Mrs. Archibald Freer should appeal to every dentist, not only because of the present movement but because of what Mrs. Freer has already done for the profession. A year ago she raised \$10,000 for the Dental and Facial Surgery Fund to aid the American Hospital at Neuilly, France, and she was also vice-chairman of the B. F. B. Permanent Blind Relief War Fund, which raised \$25,000. As a capable, energetic and patriotic worker and organizer, Mrs. Freer stands out most conspicuously among all the splendid women who are devoting their best energies toward the relief of our soldiers in the field. As she says: "It is all to help those poor fellows who are doing so much for us."

We commend this movement to the careful consideration of American dentists with the hope that they will support it loyally and thus hasten the consummation of this most worthy enterprise. The circular reads as follows:

"In view of past and coming events, it seems a proper time to have above some hospital in France the name Chicago Hospital. To raise a fund sufficient to carry out this plan the Lake Shore Drive Surgical Dressings Unit, licensed by State Council of Defense of Illinois, a small club of fifty patriotic women with a Paris committee of five, have undertaken to raise one thousand one hundred dollar subscriptions for this fund. The name of each subscriber will be placed on a tablet when the choice of building has been made and the official dedication takes place. In it will be a corner for Grace Gassette and one for Facial Surgery. Checks for one hundred dollars may be made payable and sent to Mrs. Archibald Freer, treasurer, 1420 Lake Shore Drive, Chicago, Illinois. Money to be deposited in Liberty Bonds and interest (only) to be spent on said hospital."

TWO HUNDRED AND FIFTY VACANCIES IN THE DENTAL CORPS.

1. The Surgeon General of the Army announces that there are, at the present time, approximately 250 vacancies in the Dental Corps, and that examination for the appointment of dental surgeons will be held at various points in the United States, on Monday, March 11th, 1918.

2. Application blanks and full information concerning these examinations can be procured by addressing "Surgeon General, U. S. Army, Washington, D. C."

3. The Dental Corps is a constituent part of the Medical Corps of the Army, and consists of officers in the grades of colonels, lieutenant colonels, majors, captains, and first lieutenants. Appointments therein are made at the rate of 1 for each 1,000 of the total strength of the Regular Army, authorized from time to time by law. Law requires that first lieutenants of the Dental Corps shall serve five years in that grade before being promoted, but for the period of the existing emergency this provision has been suspended by Act of Congress, and after one year's service as first lieutenant, a dental surgeon is eligible for promotion to the grade of captain, after which promotions are made in order of seniority as vacancies occur in the higher grades.

4. No applicant may under existing law be commissioned in the Dental Corps unless he is between 21 and 32 years of age, a citizen of the United

States, a graduate of a standard dental college, and of good moral character, nor unless he shall pass the usual physical examination required for appointment in the Medical Corps, and a professional examination which shall include tests of skill in practical dentistry and of proficiency in the usual subjects of a standard dental college course. Whether or not the applicant is married has no effect upon his eligibility for the Dental Corps.

5. Application for appointment must be made in writing to the Surgeon General of the Army, upon the prescribed blank form. All the interrogatories on the blank must be fully answered. In compliance with the instructions thereon, the application must be accompanied by testimonials, based upon personal acquaintance, from at least two reputable persons, as to the applicant's citizenship, character and habits.

The selection of the candidates is made by the Surgeon General from the applications submitted, and a formal invitation to report for examination to the most convenient examining board in each case will be issued by him.

6. The examinations are conducted under instructions from the Surgeon General and usually last six days. No allowances can be made for the expenses of applicants undergoing examination, whether incurred in travel to and from or during their stay at the place of examination, as public funds are not available for the payment of such expenses.

Each applicant, upon presenting himself to the board will, prior to his physical examination, be required to submit his diploma as a graduate of a standard dental college. Should he fail to do so the examination will not proceed.

7. A first lieutenant receives \$2,000 per annum; a captain \$2,400 per annum; a major \$3,000 per annum. These salaries are increased by 10 per cent for each period of five years until the maximum of 40 per cent is reached, excepting that the maximum salary of a major is \$4,000 a year, and that of a lieutenant colonel and colonel is \$375 and \$416.66 per month respectively. In addition to their pay proper they are furnished with a liberal allowance of quarters according to rank, either in kind, or where no suitable government building is available, by commutation. Fuel and light therefor are also provided. When traveling on duty an officer receives mileage for the distance traveled. On change of station he is entitled to transportation of professional books and papers and a reasonable amount of baggage at government expense. Groceries and other articles for their own use may be purchased from the quartermaster at about wholesale cost prices. Dental Surgeons are entitled to medical attendance and hospital treatment without charge other than for subsistence.

8. Officers of the Dental Corps are entitled to the privilege of retirement after forty years' service, or at any time for disability incurred in the line of duty. On attaining the age of sixty-four they are placed on the retired list by operation of law. Retired officers receive three-fourths of the pay of their rank (salary and increase) at the time of retirement.

9. In order to perfect all necessary arrangements for the examination applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon intending applicants.

PROPOSED LEGISLATION FOR NAVAL DENTAL CORPS.

The National Dental Association, at the New York meeting, approved legislation placing the Naval Dental Corps on an equal status with the Naval Medical Corps, similar to the conditions existing between these two corps in the Army, as enacted by Congress, October 6, 1917. The Legislative Committee was instructed to promote this approved legislation at such a time and under such conditions as would seem most favorable. In this connection,

and in view of some of the conflicting and discouraging reports regarding what was secured through the Army Dental Corps legislation, it was deemed advisable to wait for this to be officially interpreted before starting legislation for the Naval Corps. This has just been interpreted to our entire satisfaction, which prompts us to follow the phraseology and general plan of procedure of the Army Corps legislation. Therefore, the following bill was introduced January 5, 1918, by Senator Lodge: (This bill is already published on our editorial page.)

It should be distinctly understood that this legislation is entitled to and should receive the liberal support of the profession generally.

To that end we especially and respectfully request that THE OFFICERS OF ALL DENTAL SOCIETIES PROMPTLY WRITE THEIR SENATORS AND REPRESENTATIVES ENDORSING THIS LEGISLATION AND SOLICITING THEIR SUPPORT OF SAME. It is assumed that all Dental Societies, at some time, have endorsed this general legislative program, and it is therefore suggested that official stationery be used in writing and you be specific in stating that you express the views of your society. Individual letters are very necessary, especially from those who professionally serve or are acquainted with their Senators and Representatives; and further, it is very important that the merits of this legislation be most favorably presented to the members of both the Senate or House Naval Affairs Committees, as committee support is an essential requisite. (A list of these is hereinafter incorporated.) In these letters it can very properly be stated that this proposed legislation is in exact harmony with what was enacted by Congress, October 6, 1917, for the Army Dental Corps, and, as a question of justice, the same conditions should be provided for the two branches of the service. This appeal demands your prompt attention and I will appreciate it if you will please forward to me such replies as are distinctly favorable or unfavorable, as this makes it possible to keep in touch with the situation in an advantageous way.

The following is a list of the committees above mentioned as published in Congressional Directory, April, 1917:

SENATE NAVAL AFFAIRS COMMITTEE.

Benjamin R. Tillman, of South Carolina.	Park Trammell, of Florida.
Claude A. Swanson, of Virginia.	Boies Penrose, of Pennsylvania.
John Walter Smith, of Maryland.	Henry Cabot Lodge, of Massachusetts.
Jas. Hamilton Lewis, of Illinois.	William Alden Smith, of Michigan.
James D. Phelan, of California.	Carroll S. Page, of Vermont.
Key Pittman, of Nevada.	Miles Poindexter, of Washington.
Thomas J. Walsh, of Montana.	Warren G. Harding, of Ohio.
Robert F. Broussard, of Louisiana.	Frederick Hale, of Maine.
Peter G. Gerry, of Rhode Island.	

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INTERPRETATION OF ARMY DENTAL CORPS LEGISLATION.

Members of the dental profession will probably be interested in knowing that the legislation enacted October 6, 1917, has finally been satisfactorily

interpreted and that the members of the Regular Army Dental Corps have received their promotion, subject to the required examination incident to promotion. This interpretation gives us all for which we have contended and harmonizes very accurately with the views presented in our report at the New York meeting. In this report we incorporated the estimates of the Army and Navy Register, relative to the number in the various grades, but those figures were under stated, since we get twelve colonels instead of nine, twenty lieutenant-colonels instead of sixteen, and eighty-seven majors instead of seventy-one. In addition there will be something more than 100 first lieutenants, of which a proportionate number will be promoted to the grade of captain as soon as they have completed one year service. This promotion on the basis of one year's service is the result of the emergency legislation for the term of the war and was authorized by the provisions of H. R. 4897, to which bill we offered our dental amendment. In view of the fact that the Dental Corps is placed on an exact status with the Medical Corps, our corps naturally gets the benefit of this emergency legislation.

While no specific mention was made of the Dental Reserve Corps in our recent legislation, my contention has always been that the legislation for the regular corps automatically provided the authority for the necessary modification of the regulation relative to the Officer's Reserve Corps to place the Dental Reserve Corps on an equal status with the Medical Reserve Corps. This position has been thoroughly verified by the official interpretation and in the future whatever applies to the Medical Reserve Corps will apply in like manner to the Dental Reserve Corps.

In connection with this legislation, I received hundreds of congratulatory messages, consisting of letters, resolutions, telegrams and cablegrams. These were received at a time when it was impossible to give them anything like the prompt individual attention they merited. Then followed weeks of conflicting reports, but now that this has been officially and satisfactorily interpreted, I take this belated and public method of kindly thanking all for their generous expressions.

Faternally,

HOMER C. BROWN, Chairman,

Legislative Committee, N. D. A.

609 Hartman Building, Columbus, Ohio.

January 15, 1918.

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RETENTION OF FULL DENTURES*

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Denture retention will be a subject and problem perplexing and perpetual until its troubles find their logical solution in understanding of its physics, adoption of a classification of jaws and standardization of the requirements and technical procedures incident to the attainment and fulfillment of the requirements in each respective class.

To those of the past and present who have pursued its study and contributed to our common knowledge of the subject, I desire to express my personal appreciation, for it is through the work of these men that I have been inspired and led to what I believe to be a better and more lucid understanding of the same.

The theory of denture retention, the subject of my paper, is covered in Wilson's Dental Prosthetics under the heading of "Principles of retention of artificial dentures," Chapter VII, page 298, and is earnestly commended for your careful reading and study.

The success of an artificial denture can be no better than its supporting foundation—the jaw. Hence, the accuracy with which we study and utilize the foundation will determine the success or failure of the restoration. Equal study and care, however, must be given the form and arrangement of the teeth, as the retention of the substitute may be impaired and the denture condemned as ill fitting and unsatisfactory, when the real trouble lies in faulty form and arrangement of the teeth. Thus do we find that the successful retention of artificial dentures is not wholly dependent upon good impressions, but upon the form and arrangement of the teeth as well.

The fundamental factors underlying and governing denture retention then, are form and accuracy of mechanical design of the restoration and the resultant physical forces retaining the substitute. Mechanical form and accuracy of design of the denture

*Read before the Chicago Dental Society Dec. 18, 1917.

are first in importance and in requirement, because the physical is the resultant of the mechanical relations created between the denture, tissues and antagonizing teeth.

The physical forces retaining an artificial denture are, *adhesion*, *cohesion* and *atmospheric pressure*.

Adhesion in this particular is the aggregate molecular attraction exerted between planes disposed at right angles to tending displacing forces by the attraction of the molecules of the interposing liquid between and for the substance of the structure of the base of the denture and the tissues of the jaw respectively, lying in such planes.

Cohesion is the aggregate cohesive attraction exerted between planes disposed at right angles to tending displacing forces in value as the surface and conformity of the base covers and hugs the adapted tissues by the molecules of the interposed liquid.

Atmospheric pressure means the force exerted by the weight of the aeriform liquid which envelopes the earth, the weight of which, at sea level, exerts a pressure of 14.7 lbs. pressure to the square inch upon all surface or surfaces exposed to its presence, as would be and is manifested upon the exposed surfaces of an artificial denture to such extent and degree as the adapted jaw has surface and space or spaces between the surfaces of the adapted base and that of the jaw and the degree of evacuity of such space or spaces.

The theory of retention and the method of denture adaptation or construction for its accomplishment, about which this paper deals in part, insures the maximum amount of retaining forces of adhesion, cohesion and atmospheric pressure.

The requirements of the construction are, that the base of the denture should cover the greatest surface possible and have added to it a periphery with border surface continuous with that of the base of the denture and that the surface of such border be extended upon and adapted to the flexible peripheral tissues so that there is created a seal and valve like action between the flexible tissues of the periphery, to preclude, therewith, the ingress of air under the base of the denture and resist or prevent complete dislodgement of the restoration through the indirectly applied resisting forces of the atmospheric should displacement occur.

Precluding the ingress of air between the surface of the base of the denture and the tissues of the jaw at the time of displacement of the restoration, sealing the space occurring between the base and

the jaw without admitting the air, forms thereby, simultaneously with displacement, a partial vacuum.

The TIDAL or momentary vacuum created between the base of the denture and the adapted tissues of the jaw, is therefore manifested only when the resistive forces of the cohesion of the molecules of the interposed saliva are overcome and displacement of the denture occurs. Since the resultant atmospheric pressure is the direct force holding the denture against further partial and complete dislodgement when forces displace and partially dislodge the structure, forming a relative vacuum, it is obvious that any force that creates the space, degree of evacuity and resultant atmospheric pressure, increases, automatically, thereby, resistance of the denture to further partial or complete dislodgement. The degree of evacuity of the space is in direct ratio to the volume of the vacuum, owing to the fact that the sealed periphery precludes the ingress of air and the increasing space between the base and the jaw still accommodates the same quantity of air. Boyle's Law governing the relationship between the pressure and volume of gases under a constant temperature, covers this particular point and is as follows: "Pressure of a given mass of gas varies inversely as the volume of the space within which it is confined." That is, if the volume of space existing under the denture consists of 1 c. c. of volume at a pressure of one atmosphere, when increased to 2 c. c. of volume the pressure according to this law would be one half of an atmosphere.

Demonstration of the above principle (Boyle's Law) may be made with the hypodermic syringe. Upon partial removal of its piston, a relatively evacuated space occurs in the barrel simultaneously with extraction of the piston, and as removal of the piston progresses, increase of the force required for further removal is simultaneous with that of its further removal. In our application of this principle to denture construction, we consider the jaw the piston and the denture the barrel. Seal for maintenance of the evacuated space occurring between the base of the denture and the adapted tissues of the jaw as partial dislodgement—removal of the jaw (piston) progresses being effected by peripheral adaptation with the flexible tissues—the gasket of the syringe. Unlike the syringe, however, the denture and jaw differ in that increase of base surface to form evacuated space occurs laterally or at right

angles to the direction of movement of the denture in displacement and partial dislodgement, whereas, in the case of removal of the piston of the syringe, increase of surface for evacuated space occurs in line or parallel with the direction of movement of the piston. Therefore, in the case of the denture both increase of evacuity and base surface exposed in direction to resist further partial or complete dislodgement are accomplished, while in the case of the syringe increase of evacuity alone resists further or complete withdrawal of the piston.

Extent of jaw surface and degree of apposition between the base of the denture and the adapted surface of the jaw tissues then, determines the relative extent of the respective forces exerted by adhesion and cohesion retaining the artificial denture.

Peripheral construction and adaptation for a seal and valve like action with the flexible peripheral tissues, sealing space occurring between the base and jaw created by displacement of the denture, preventing the ingress of air, forming a relatively increasing evacuated space indirectly applying the force of the atmosphere thereby, aids in preventing or opposes partial or complete dislodgement of the artificial denture should displacement occur.

DENTURE ADAPTATION.

The ideal condition then, for the maximum utilization of the forces of adhesion, cohesion and atmosphere pressure for the retention of an artificial denture against displacement and partial or complete dislodgement, is to have the base cover the entire surface of the jaw; to add to the base a periphery, extending upon and adapted to the flexible peripheral tissues, sealing the peripheral border against the ingress of air.

Credit for the idea of constructing and establishing such relations between the base, periphery, jaw and flexible peripheral tissues, should, in so far as our information dictates, be given Dr. W. V-B. Ames, of Chicago, for it was he, in so far as we know, who, years ago, first conceived of their importance and in 1885 (*Independent Practitioner*, July) demonstrated their principles. Others notable in early appreciation and use of their principles, were the Greene Brothers of Missouri, and especial admiration and appreciation should be held for their untiring, constant and persistent labors for their adoption. Credit belongs to these men, so we under-

stand, for the correctable compound method. Also the excellent work of Mr. Samuel G. Supplee, of New York, on the technic in the use of modeling compound should not be overlooked. The great good he has done in directing us to a better understanding of its manipulation and possibilities should be appreciated. Through his work and efforts our knowledge and technic in impression taking has been greatly improved. I disapprove however, calling his work the "Supplee Method." The method of securing a "muscle trimmed" impression in modeling compound was devised by the Greene Brothers. Supplee's work should properly be designated the Supplee Technic.

The method of denture adaptation to be illustrated and discribed permits, it is believed, of an infinitely greater surface tissue adaptation and wider range of movements of the denture without causing displacement and unsealing or breaking of the peripheral valve seal, should displacement occur, than is secured in less accurate methods of adaptation or in the old method of denture construction where peripheral adaptation and valve seal are entirely absent and the edges of the denture permit the ingress of air, and complete dislodgement of the restoration should displacement occur.

To fully utilize mechanical and physical forces in the retention of artificial dentures, one should know exactly what jaw conditions favor and what conditions do not favor retention. To this end adoption of a classification of jaws and standardization of their requirements and technical procedure to the attainment of such requirements is, in the opinion of the essayist, not only desirable, but esential to a better understanding of denture construction and retention.

That edentulous jaws may be classified and divided into two general groups, is true, and that through such classification we shall be directed to a better understanding of the physics, mechanics and general conditions governing full denture retention is equally true. Also, that through such understanding definite lines of procedure may be formulated and each class rationally treated thereby.

Class I may be designated as that type of edentulous jaws that may be classed as normal—jaws with well defined ridges and normal quantity and tone of the overlying and adjacent tissues.

Class II may be designated as that type of edentulous jaws that are abnormal—jaws with poorly defined or excessively ab-

sorbed ridges, marked distortion or loss of facial contour and abnormal or subnormal quantity and tone of the overlying and adjacent tissues.

Class I jaws offer the greatest amount of surface for adaptation, consequently, greater physical forces for denture retention. The well defined ridges in this class also offer mechanical retention assisting in securing the denture against horizontal mobility, and often secure the restoration against vertical displacement. These, together with the ideal cushion support offered by the normal overlying and adjacent tissues, make Class I jaws easy of artificial denture retention.

Jaws of this class may be and are usually fitted with the most indifferent construction and adaptation, most any kind of an impression and denture construction serving to produce passable retentive results. Retention in this class is not so dependent upon peripheral construction and valve seal, nor is particular arrangement and efficiency of the teeth especially essential to passably satisfactory retention.

Class II jaws are *entirely dependent for retention upon the physical forces alone*; no mechanical retention whatever is afforded in this class. Jaws of this class require for their successful management the closest adherence to every detail of the mechanical relations of the dentures to the tissues and to one another.

The greatest available jaw surface possible for base adaptation should be utilized in this class. Peripheral construction and valve seal should be carefully and positively secured. And in case of the upper jaw, peripheral valve seal with the flexible tissues of the soft palate under considerable pressure, is strongly indicated. Insuring as nearly as possible in this, the most difficult region for maintenance of adaptation of the periphery of the denture with the flexible tissues, a perfect valve seal against the ingress of air upon displacement and partial dislodgement of the denture.

The basic essential in the taking of a perfect impression for full and complete utilization of the jaw and flexible peripheral tissues desired to be utilized for the adaptation and retention of an artificial denture is a tray suited to the case. It is my belief that the only accurate and satisfactory way to procure a suitable tray, is to construct a special tray for each individual case.

THE IMPRESSION MATERIAL.

Plaster of Paris, mixed to the correct consistency, is far more yieldable and adaptable than any other material with which we are familiar, and by the aid of a correctly formed individual tray, may be handled with such control that any desired form of impression may be secured. The particular feature of "post-damming" or adaptation under pressure upon the flexible tissues of the soft palate, however, seems best accomplished with modeling compound.

INDIVIDUAL TRAYS.

For the construction of individual trays, we use The S. S. White Impression-Tray Compound, which was suggested by me for the particular purpose of making individual trays quickly, efficiently and economically. It is jet black in color to make it readily distinguishable; has a high melting point to assure, when set or hardened, ample rigidity against distortion in removal from the metal tray and subsequent shaping and handling.

It is necessary in employing the impression tray compound to have a few regular metal trays of suitable forms and sizes. Select a tray of the proper shape for the case, but somewhat larger than you would ordinarily use. Fill the tray with the compound, softened in hot water. Pass the exposed surface of the compound over a Bunsen or alcohol flame to remove inequalities in the surface and give it a glaze. Plunge into hot water to wet the surface and prevent sticking to the tissues, and as soon as it cools to a bearable degree insert in the mouth and secure a compound impression in the regular way. In a short time it can be removed from the mouth and placed in cold water to harden.

Remove the impression from the metal tray, and with a sharp knife, trim away the excess compound approximating the peripheral outline and contour of the proposed tray. (Approximating the contour of the proposed restoration in the tray should be credited to Dr. M. M. House, of Indianapolis, Ind.)

TRIMMING THE UPPER TRAY.

Beginning at the labial margin, the tray is trimmed thin at the labial frenum, and the frenum allowed liberal relief. Passing on to the region formerly occupied by the cuspid teeth on either side, the tray is given a gradual fullness or prominence, restoring the cuspid

eminences. The tray should be as high and full in this region as may be required to lift or displace the tissues for retention of the proposed denture and restoration of disturbed facial contour—the idea being to accentuate— build up the jaw ridge, increasing its area, and make in the finished impression the desired facial restoration.

Passing posteriorly from the cuspid eminences or about midway between the cuspid eminences and the tuberosities, we find the malar process of the maxilla, which registers a downward curve in the compound impression. The process is so situated that it ascends or descends at an angle of about 45 degrees to the general plane of the alveolar ridges or base of the proposed denture.

The margin of the tray in this region must be given particular consideration and preparation. The process is thinly covered with tissue and disposed at an unfavorable angle to permit of much vertical movement or bearing of the denture and undue pressure in this area should be certain.

Moving posteriorly of the malar process, a well defined cavity, as a rule, is found, and offers extremely valuable area for peripheral adaptation and denture retention. This space may be called the buccal cavity, and defined as the cavity formed or bound by the malar process, the cheek, the angle of the mouth and the tuberosity. It is indeed amazing how little this valuable space is utilized, and on the other hand quite astonishing how extensively it may be utilized.

In forming the tray for this space, allow it to go well up into the cavity, filling it buccally as well as vertically preferring, however, to accentuate or favor vertical height rather than buccal fullness. Next, outline and trim the posterior or palatal border of the tray. The outline of the tray should approximate that of the junction of the hard with the soft palate. Its length, however, should extend well upon the soft palate, the exact length of which will be determined in a later operation. Finally, cut out the tray relieving locks about undercuts and points of impingement upon soft flabby ridge tissues allowing them to hang freely in the tray.

Construction of dentures for upper jaws not requiring facial restoration or permitting presence of base and periphery upon the tissues in the labial region of the jaw and flexible peripheral tissues, do not permit peripheral adaptation in the buccal areas under pressure upon the flexible peripheral tissues. Construction and adaptation of periphery upon the flexible peripheral tissues in the

buccal areas are desirable, but care should be exercised in preventing pressure, the positive force thus created by displacing the tissues would react against retention of the denture and would not, in the absence of periphery and peripheral valve seal in the labial region, be met with and overcome by atmospheric pressure by the forming of an emergency vacuum upon displacement of the denture from its position of basal seat as in the case of that afforded where peripheral construction and valve seal are complete and perfect. This class of cases may be properly subclassed and would come under the subclass of class I jaws.

TRIMMING THE LOWER TRAY.

The general preparation of the lower tray is the same as that of the upper. The lower jaw, however, has its individual characteristics. One is that absorption takes place in such manner that the curve or circumference of the ridge remains practically unchanged or fixed. Whereas, in the case of the ridge of the maxilla, absorption reduces its circumference quite extensively. Consequently facial contour is less disturbed in the loss of the lower teeth than in the upper. Therefore, less fullness is required in the lower denture for the restoration of disturbed facial contour than in the upper.

The lower jaw, like the upper, also has much over-looked and neglected valuable surface and flexible peripheral tissue surface for base and peripheral adaptation for denture retention. Aside from our general failure to utilize the available area, the lower, like the upper jaw, has, as a general rule, two spaces that are much over-looked. These may be called the lingual spaces. They lie on either side of the tongue and are bound by the mylohyoid ridge, the floor of the mouth and the tongue. These spaces are, when present, and utilized, valuable aids to denture retention in those excessively absorbed cases, or so-called flat jaws. Fit the tray well into these spaces, aiming to utilize them in the completed denture. The supporting foundation or ridge of the lower jaw is more or less circular back to the region of the first molars. The diverging flanges formed by carrying the base of the denture into these lingual cavities will act as tangents to the circle and prevent or assist in preventing, horizontal movement of the circular base.

The individual tray being approximately outlined, is now ready for final shaping and conformation to the tissues.

SHAPING AND CONFORMING THE INDIVIDUAL TRAY.

Shape and conform the tray to the tissues without undue pressure or fullness, but under just that degree of pressure and fullness as may be indicated and desired. There are, in my judgment, two acceptable ways of best conforming the periphery of the tray to the flexible tissues. One method is that of the late Dr. Greene, previously referred to, and is no doubt familiar to most of you. The method consists of tracing modeling compound upon the edge of the tray (tray of Impression Tray Compound the same as upon the edge of a metal tray) and while hot and plastic inserting the tray in the mouth and having the patient make movements of the muscles which in turn cause the compound to flow and conform to the tissues.

The other method is one devised by myself, though I have been told that it is not new. Be this as it may, the merits and utilization of its principles are that in which we are most concerned.

The method in its application to the upper jaw consists of successive layers of very thin plaster. As a rule only two mixes are necessary. The first mix registers the position and approximate extent of the imperfections of the improvised compound tray. Where the tray is too long or impinges, the plaster is displaced, and where too short, plaster is added. The tray is freed of excess and points of impingement are cut away to free the tissues impinged. The tray made up partly of tray compound and partly of plaster may now be considered perfect and is ready for the second mix of plaster with which we plan to secure an accurate impression of the jaw under such displacement and pressure upon the tissues as previously decided advisable and predetermined in the preparation of the individual tray.

Since adaptation under pressure upon the flexible tissues of the soft palate is a prerequisite to retention in its maximum degree; and since there is no means of confining or restricting the escape of the flowing thin plaster from the tray about the tissues in this region, as in the case of the labial and buccal borders where the tray is overlapped and bound in by the tissues of the cheeks and lip, it is obvious that adaptation of the palatal border of the denture under pressure upon the soft tissues must, if accurately made, be secured by means of some plastic material the flowing stress of which offers such resistance as may be required to give the desired pressure upon the tissue.

Modeling compound seems to be the ideal material for use in this connection.

The Fovéola Palatina (Rauber Kops' Anatomy) indicate the junction of the hard with the soft palate in the median or at the palatal suture. The Fovéola Palatina and the general demarcation between the hard and the soft palate are more accurately outlined in the thin plaster impression after the method of the essayist than with any other method with which he is familiar.

These indications together with those distinguishing the tuberosities are taken as guides by which the location of the soft palate and the length of the base of the proposed denture may be definitely determined and the desired pressure made upon the flexible tissues of the soft palate.

The posterior border or length of the impression and tray are cut off conforming their outline to that of the junction of the hard with the soft palate, trimming them to such length as it is desired the finished denture should be.

The remaining outlined plaster representing the impressed surface of the tissues of the soft palate and the extent of this area it is decided the base of the proposed denture should cover; and which it is also desired adaptation of the same should be under pressure, is next entirely cut away and the black compound of the individual tray exposed.

Modeling compound, preferably Kerr's in stick form, is softened with dry heat and traced upon the top of the exposed projecting surface of the black compound tray. The impression is next dipped into warm water to saturate the plaster and prevent the compound sticking to the tissues when it is inserted into the mouth and adjusted to place. Adjustment of the impression to its seat is made as the varying temperature and flowing resistance of the compound against the tissues being impressed may indicate to effect the required amount of pressure upon the flexible peripheral tissues of the soft palate as adjustment of the impression to its seat progresses.

Securing adaptation under pressure upon the tissues of the flexible soft palate by this or some equally scientific means, insuring tension of the tissues under equalized pressure is strongly advocated.

Pressure engagement of the periphery of the denture with the tissues by molding or swaging the base upon casts that have been altered by cutting and scraping to increase the extent of engagement

of the periphery with the flexible peripheral tissues, is guesswork and unscientific. The frequent injury of the tissues and the suffering imposed by such practice evidence the empiricism of the method and warrant discouragement of its practice. Casts made from accurate impressions secured in accordance with the demands of the case require no cutting or scraping.

Careful study and outline of the hard palate should be made and generous relief of any pressure of the base of the proposed denture upon this area should be certain. Otherwise, pressure of the base upon the tissues of the hard unyielding area may establish a fulcrum, cause rocking of the base and impair the stability of the structure.

The greatest care should be given the selection and arrangement of the teeth in this class. Teeth with long, sharp, efficient cusps should be employed, that the forces necessary to the functions of efficient incision and mastication may be minimized. Careful study should be made of the arrangement of the teeth, with especial regard to levers that are formed under the stress of the forces of incision and mastication and tend to dislodge and impair the stability of the dentures. And lastly, but in no wise less important, is the anatomic relation of the teeth. These should be carefully worked out, their aid in increasing the efficiency and balancing the dentures in the process of incision and mastication determines in a very great measure the success of denture restoration.

FORM AND ARRANGEMENT OF THE TEETH AS AN AID TO DENTURE RETENTION

Anatomical Occlusion and Articulation.

My understanding of the meaning of the term anatomical occlusion and articulation is, that the teeth, during movements of the mandible, when in the varying positions in the process of mastication, should be so arranged that the cusps of the teeth of the opposing jaws shall establish such relations of contact between them while gliding to the position of fixed occlusion, varying spaces should be formed to cut, crush and grind the food as the closure of the teeth progresses, providing, thereby, points of support against displacement of the dentures, by contact of the antagonizing cusps, with spaces for food.

If this be true, I want to go down in the record of the proceed-

ings of this meeting as saying that, in my opinion, we have had, up to this time, no anatomical occlusion and articulation.

The use of the face bow; the measuring and recording of the condyle paths; the movements of the so-called anatomical articulators; the setting of teeth to theoretically determined planes and curves in wax to the arrangement known as three-point contact, have all been productive of nothing in assimilating anatomical occlusion and articulation. Therefore, no aid to denture retention through this supposed source has been an actual reality, and those advocates and followers of such theories and practice have, in my opinion, been running wild on a delusive theory.

These theories, in part, teach that the general plane of the teeth should be arranged, irrespective of the alveolar ridges, parallel with a line drawn from the ala of the nose to the tragus of the ear. This and its associate rules have long since been found wanting and have not been, nor to my mind will they ever be generally accepted. Although, from the voluminous literature upon the subject, and especially the work and claims of one of our manufacturers, one would be led to believe that the last word on the subject had been said and perfection of its practice attained. Few there are, comparatively, however, that have adopted and are practicing its teachings, and these few will, in time, like the rest of us, discover its shortcomings and abandon its practice. So we shall share the keenest pleasure in the disappearance from our text books and literature of these much overworked theories, that we may not be further misguided into error.

Do not be discouraged, however, for there is such a thing as anatomical occlusion and articulation, and when such form and relations of the teeth are secured, not only greater efficiency, but extremely valuable aid to denture retention results. It is my opinion that the form and arrangement of the teeth in Class II jaws are as important and share equally in importance with that of the construction and adaptation of the base and periphery of the denture.

What, then, is anatomical occlusion and articulation? How, and by what means, may we arrange teeth anatomically, so as to secure greater efficiency and their aid in the retention of artificial dentures?

Anatomical occlusion and articulation means that the artificial teeth should be so formed and arranged that they will occlude and articulate without undue interferences, balance and support the dentures against displacement under the stress of the forces of incision

and mastication, guide the co-ordinating muscles in directing the movements of the mandible and at the same time, in the positions or relations of articulation, provide spaces for food.

Teeth may be anatomically arranged by having an articulator capable of imitating all of the movements of incision and mastication of the mandible and then have these movements under such control that we may utilize them for the perfect positioning and grinding of the teeth in anatomical relations as guided by the esthetics, the alveolar ridges and the movements of the articulator.

Present teaching and practices are now wrong. First, because of faulty methods and articulators. Second, because the cusps of the teeth now upon the market are not long enough to permit meshing or interlocking so that in movements of the mandible they will reach and maintain contacts with their antagonists, provide adequate spaces for food and balance the dentures under the stress of the forces of mastication.

Teeth with deep angular cusps (guiding angle 45 degrees), correctly arranged, balance the vertical and lateral or horizontal movements of the mandible, as typical to nature, when in the stage of greatest efficiency; definitely guide the co-ordinating muscles in directing the movements of the mandible, also typical to nature; provide spaces for food; balance and support the dentures in the process of incision and mastication against movements from their basal seat; and in case of displacement of the dentures, steady and guide their return to their normal position comparable with the guiding and supporting influence of the rails of the railway track upon the railway coach, the rails the lower teeth (high cusps) and the wheels, their flanges (long cusps) the upper teeth. The train without the flanges upon its wheels to secure and guide its movements upon the rails (movements of the mandible in the case of the masticatory apparatus) would leave the track, not travel its intended course and be a failure. Likewise may we justly and logically regard the principles involving the construction and uses of artificial dentures if we are to expect them to work to perform the function of incision and mastication efficiently, and not be a failure. Especially restorations required in Class II jaws. We must, therefore, incorporate or provide in their construction suitably formed and correctly arranged teeth or they will not be guided and supported in the functioning movements of the mandible and will be a failure to such degree as

they may be deficient in the requisite fundamentals to the highest and most efficient type of denture restoration.

In our latest edition of a prosthetic text book, we find and quote the following:

"Let us consider the relation of the mandible to the maxilla, first, with the natural teeth present and in occlusion, and second, after the jaws become edentulous. In the first instance the masticatory muscles bring the mandible upward until when the teeth are in occlusion it is in a state of rest. In this position the facial profile is normal, while the lips rest easily against each other without apparent muscular tension, or conscious effort on the part of the individual."

In the above quotation we note the author states that when the teeth are in occlusion, the mandible is in a state of rest. If there is anyone in this audience whose mandible, when the teeth are occluded, is in a state of rest, please make the fact known in the discussion following this paper. It will be the first one I have ever known.

The teeth are occluded through muscular effort only, therefore the mandible could not, in the position of occlusion of the teeth, be in a state of rest.

We note further that when the mandible is in this position (position of occlusion of the teeth), the facial profile is normal, while the lips rest easily against each other without apparent muscular tension, or conscious effort on the part of the individual.

Since the normal facial profile is that of the features when the muscles are relaxed and in a state of rest; and since it is true that, normally, the mandible is not in a state of rest when the teeth are in occlusion, we must conclude that the rule of determining the length of the bite and subsequent positions of the proposed teeth according to the above indications, are not esthetically or anatomically correct.

The present rule is to set the teeth to approximate a length in line with the lips and not overlap the upper or under-bite the lower anterior teeth to any considerable degree, owing to leverages that would be formed, displace the dentures and break off the anterior teeth.

This would be a very fine rule if turned the other way around. The rule is absolutely wrong and its application is the greatest cause

for displacement of dentures and breakage of anterior teeth. Why? Because, to set the anterior teeth in line with the lips and not permit them, when occluded, to pass or overlap as in nature, means simply this, that the molars and bicuspid have to be raised and lowered to occlusion to a bite corresponding in distance between the ridges with the incisive bite, instead of the occluded bite. In other words, following this rule produces dentures the presence and operation of which in the mouth force the bite open to the extent of the depth of normal overbite and interfere with the movements of the mandible, and the patient experiences a feeling that the mouth is held open and the teeth are too long. Therefore, teeth so arranged do not efficiently restore the function of incision and mastication, and the excessively long molars and bicuspid interfere in the movements of incision and mastication, dislodge and impair retention of the dentures.

In the absence of overlapping anterior teeth, as normal to nature and necessary to the function of incision, the patient manages to find a point of contact between two of the opposing end to end related incisors and in their effort to incise, it is discovered that the teeth do not slide by and shear the object attempted to be incised, but merely pinches or punctures it, and in this predicament the patient thoughtlessly, though naturally, pulls the object in two, with the frequent result of a broken tooth.

The incisors, if correctly arranged to overlap, and ground to establish perfect opposing articulating edges and planes, will, with the minimum amount of pressure, efficiently perform the function of incision and equally distribute the pressure upon all the anterior teeth. And in so arranging them the molars and bicuspid will be relatively shortened and normal anatomical relations restored.

Teeth should be so arranged that they conform to the esthetic, anatomic and physiologic needs of the patient.

The misleading and absurd rule that confines us to a definite line of procedure in obtaining the relation the teeth and jaws should bear to each other, irrespective of the modifying influences of the individual patient, should in my opinion, be disregarded altogether.

Each case of denture construction is a law unto itself and no rule of averages, be it ever so inclusive, can possibly supplant or adequately supply the specific demands arising in the individual case. The rule that the length of the teeth should be established in

accordance with the lips when in position of repose, is no less impractical than is the rule of establishing the occlusal plane.

The misleading feature of this rule, by which we are supposed to determine the length of the teeth, is due entirely to the fact that the rule does not conform to the conditions imposed in nature. When the muscles controlling mandibular movements are in a state of rest the lips normally are extended to their full length. The muscles controlling mandibular movements are not constantly contracted—nature could not tolerate a constant contraction of these muscles—and in their unfunctionating state the mandible hangs down to the extent of relaxation of the suspending muscles and tendons and the teeth are not normally in occlusion. The reverse of this normal repose in lip position would be found when the teeth are occluded and the lips are compressed and much shortened. It is my idea that the latter position of the lips more nearly indicates the length of the bite when the teeth are in occlusion than does the position of the lips when the muscles are relaxed and at rest.

I have dealt at length on this particular point because it will help to emphasize the things I am contending are wrong in respect to some of the rules and theories heretofore set down as definite facts, which, in my judgment, are very great hindrances to our success and advancement in the art of denture construction, both as regards retention and efficiency.

AN UNUSUAL SURGICAL CASE FROM DR. BROPHY'S CLINIC

REPORTED BY EARLE H. THOMAS, M.D., D.D.S., LL.B., CHICAGO, ILL.

This case was of a male, age 48. He presented himself at the clinic on October 15th, 1916, giving a history as follows:

Three weeks previously he had been suddenly attacked with chills and fever, pains in back of head and shoulders, and acute rheumatic joints. This was followed by a swelling of the entire right side of the face and head which was diagnosed variously as rheumatic fever, mumps, and erysipelas. This lasted about one week and, not getting any relief from the treatment of three different physicians, he decided to consult a dentist. The dentist found a large swelling around the lower right third molar, which

tooth was loose in its socket but caused the patient no pain. He extracted this tooth and drained a large quantity of pus through the socket.

A few days after this, the patient while yawning heard a snap in his jaw which he recognized as a pathological fracture;



Fig. 1

Showing the area of enlargement and the extent of the cavity which could be filled up with air by the patient.

after which he could hear and feel the ends of the bones rubbing right cheek closing the eye and there was an enormous enlargement against each other whenever he moved his mandible. The swelling of the side of the face became continuously larger until he presented himself to the clinic a little over a week after the fracture, at which time there was marked swelling of the right parotid region, the of the right side of the scalp over the whole area included by the temporal fascia. Upon palpation, this was found to be full of fluid and on exerting pressure on it, pus would escape into the mouth

from the socket of the lower right third molar. By careful pressure the swelling on the head could be practically all reduced, all of the pus being drained into the mouth. Then the patient surprised



Fig. 2

Showing the area of the mandible that was necrotic.

us by showing us a peculiar phenomenon which he had accidentally discovered.

By holding his nostrils and lips closed and raising the air pressure in his mouth by blowing, he could force air through the sinus and fill up with air the whole cavity where the pus had been, over the entire area covered by the fascia of the temporal muscle, and

thus make the swelling as large as it was previously. (Fig. 1.) One would have to see this to appreciate how remarkable it was.

Examination of the case showed marked deformity, the chin being displaced to the right side and there was also marked creptitus. The patient had lost considerable weight and was in a very run down toxic and emaciated condition.

A stereopticon X-ray (Fig. 2) was taken of the case, which



Fig. 3

Showing the amount of bone regeneration at the end of four months.

showed that all of the body of the mandible posterior to the second bicuspid and practically all of the ramus on the right side except the condyle, was necrotic.

The patient was operated on November 1st, under a general anesthetic and with the exception of the condyle all of the mandible on the right side, as far anterior as the second bicuspid, was removed, *being very careful to preserve all of the periosteum so that new bone would subsequently fill in.* This was done through the

inside of the mouth, and the large cavity packed with iodoform gauze, which was changed every second day until the whole cavity filled in with granulation tissue. Practically all of the swelling over the side of the head disappeared.

About the time the cavity in the mouth was completely filled in



Fig. 4

The final result showing the chin to be nearer the median line than one would expect under the circumstances.

with granulation tissue, the side of the head started to swell again and became full of pus over the whole area previously infected. This was no doubt caused by infection remaining under the scalp after the sinus closed, and which got the upper hand again through the lowered vitality of the patient. This was lanced on December 7th, under ethylchlorid spray, and a very large quantity of pus was evacuated. An exploratory probe could be passed through this incision to a point about two inches behind the ear, almost to the median line of the cranium above, and forward as far as the attach-

ment of the temporal fascia. An iodoform drain was inserted and a compression bandage applied over the side of the head to obliterate all spaces. The drain was changed every second day for about two weeks, when this part was practically entirely healed. In the meantime, the remaining part of the lower jaw was wired to the upper jaw in the correct relation and was kept wired for a period of five months.

Fig. 3 was taken four months after the operation and at that time the periosteum which had been preserved had regenerated enough bone that it could be felt on palpation, and extended as far as the neck of the condyle. The extreme angle of the mandible was not regenerated out to its former shape, but was considerably rounded, due, no doubt, to the tension of the masseter and internal pterygoid muscles pulling the periosteum upward at that point.

When the wires were removed from the teeth, the patient was found to have an artificial joint in the region of the neck of the condyle. His chin, although not exactly in the median line, does not deviate to the right as much as one would expect under the circumstances (Fig. 4). He has had a lower denture made and is now able to masticate in a very satisfactory manner.

The features of interest in this case are the large area involved by the suppuration; the fact that the cavity could be distended with air by the patient; and the great extent of bone regeneration.

CAST ALUMINUM DENTURES

BY J. AMENTA, CHICAGO, ILL.

"Anything worth doing is worth doing well." Just a proverb, but one which will guarantee good results and the admiration of discriminating persons if applied in earnest to the work in hand.

Dentistry is one of the youngest of the professions, and although rapid strides have been made within the past few years in the way of special appliances for unusual tooth restoration, the utilization of cast aluminum for various forms of dentures, etc., there is still much to be accomplished, especially in dental prosthesis. The love for the profession should prompt every practitioner to publish his practical experience along the lines of original ideas and appliances for the benefit of his fellow practitioners and of humanity.

It is a well known fact that a good surgeon must be a good mechanic, and as dentistry is a subdivision of surgery, and as books cannot be printed rapidly enough to keep pace with the advancement of new theories and practical ideas, we naturally look to the professional magazines as an intermediate.



Fig. No. 1

Showing gum sections held in place by aluminum flange on labial. No rubber exposed.

For many years I have been specializing in aluminum dentures with very gratifying results, both to myself and to the profession whom I serve, and as I have often seen the most miserable work in this line I feel that what I have to say should at least attract the attention of those who are interested in this particular class of work.

Aluminum has advantages and disadvantages. The advantages

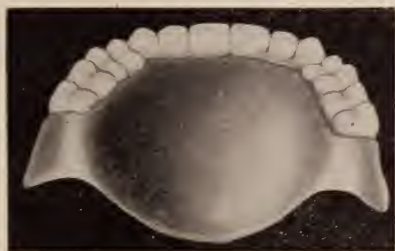


Fig. No. 2

Lingual view of gum section plate shown in Cut No. 1. The special feature of this denture is that the sections are attached with rubber and are easily replaced in case of breakage, but *no rubber is exposed*.

are: (1) Light weight, (2) ease of sterilization, (3) no irritation to the gum tissue, (4) sensitiveness to thermal changes. The disadvantages are: (1) Imperfect connection between rubber and aluminum, usually due to faulty construction and requiring more skill than an ordinary rubber plate; (2) dissolution and porosity

due to hyperacidity of the saliva. This disadvantage is almost entirely eliminated by the use of absolutely pure aluminum and the proper technique in casting, which again requires a great deal of skill and only comes from long experience.

Aluminum plates should be made with as little exposed rubber as possible.

The three types of full dentures with which I have had the most success are as follows:

(1) All teeth attached to the plate by casting the aluminum around the pins of the teeth—no rubber on the lingual surface. The labial and buccal surfaces—the gums—are made of pink rubber, which is held in place by a rim around the periphery of the plate, and by leaving spaces under the necks of the teeth.

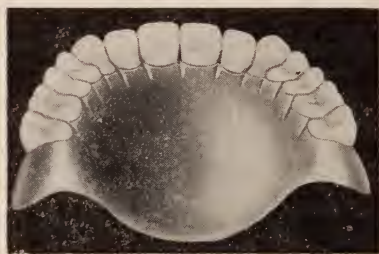


Fig. No. 3

Lingual view of cast aluminum plate with Justis crowns for the six anteriors. Note natural spaces between teeth.

(2) Cast aluminum plate using pin teeth for the bicuspid and molars and Justis crowns for the incisors. The posterior teeth are attached to the plate permanently as in No. 1. Aluminum posts and sockets are cast and the six anterior crowns are cemented to place. Should one of these incisors become broken it is easily replaced. The gum is pink rubber.

(3) Cast aluminum plate with gum section teeth. The gum blocks are attached with rubber and should a block become broken it is easily replaced, but absolutely no rubber is exposed. This makes a very beautiful and esthetic denture.

It would require too much space to enter into a detailed and comprehensive description of the construction of these different cases. The main object of this article is to call attention to the possibilities of the aluminum cast plate as applied to the different methods herein outlined.

INDUSTRIAL DENTISTRY AND WELFARE WORK IN
ILLINOIS*

BY EARLE H. THOMAS, M.D., D.D.S., LL.B., CHICAGO, ILL.

In the olden days when men worked alone at their various occupations, the apprentice had the thoughtful care, the consideration, the kindly human understanding and assistance of the man employing him. In those days practically the only banding together of great numbers of men was in the fighting army for the object of destruction and no one ever conceived of the concentration of an army of free men for a single vital commercial purpose with the object constructive in its nature. But today important industrial corporations number their workers by the thousands and the conservation of these people requires stupendous care. Accidents, sickness and other misfortunes become problems of masses and are no longer thought of as individual troubles of John Jones or Mary Smith, in which John or Mary needs a helping hand. But the need of each worker is there just the same and should it not be met in some way? Yes, the duty and obligation of the corporation does not end when it has provided a place to work, work to do, and the regular payment of a certain sum. It uses up human life and it is therefore morally obligated to protect that human life, while it is extracting the serviceable, and after it has left only waste. The employee is more than a means to an end—he is also an end in himself. The popular conception at one time was of the soulless corporation, its machinery was not allowed to deteriorate, but the human organization—the worker—received relatively little attention. But industry has been rapidly developing a conscience. Men of broad, keen, penetrating vision recognized the injustice and economic waste of it all. Their reasoning was simplicity itself for they stood upon the fundamental principle of the value of the human—a value above property; above institutions, and that the conservation of the things most valued was the first law of an effective working plan.

Welfare work is a recognition of this principle, is an effort

*Read before the Northern Illinois Dental Society, October, 1917.

to remedy the previously existing defects of industrial life, and is a direct expression of the constructive spirit.

The process of crystallization of this work has been along more or less definite and pretty well defined lines and its broadly scientific development has lifted it to a dignity as part and parcel of almost every progressive industrial organization, with departments working in harmony and in charge of welfare experts. Both employers and employees have been impressed with the idea that those who are giving aid and those who are receiving aid are inseparably bound by a great common interest—the business—and both are striving for one common purpose—namely, the general welfare of all.

The welfare departments endeavor to assist the employees in those things where experience has shown assistance is desirable, and they do so from a desire to be generally and practically helpful.

The universalness of the response to this human need has made it possible for welfare work to reach hundreds of thousands with its cheering message and any employer who has failed to see this has blinded himself to one of the greatest opportunities for helping others and at the same time helping himself, that the business world of today provides. Besides adding to the output of the plants it adds to the number of productive years of the workers. The family as well as the worker is helped to advance and thus the result is the betterment of the community of which they are a part.

One Firm put it this way—"The entire matter of welfare work and all its branches resolves itself into a matter of reciprocation. The employees are encouraged to give their best services to the firm, and the firm in appreciation thereof, gives every possible convenience conducive to health conservation, mental improvement and economic wellbeing. Industry, Humanity, Efficiency—these are the things we value and they must be inseparable. As a consequence, thruout the entire business there exists a closer bond, a spirit of unity, loyalty and solidity that could be effected in no other way."

Probably very few of you have more than a faint idea of the various activities listed under welfare work and I will therefore briefly enumerate a few of them. There is the installation and maintenance of the most modern ventilating and heating plants so as to have a plentiful supply of clean fresh air; and the keeping of

this air free from odors, gases, dust, and other impurities by the installation of vacuum fans, by the proper disposal of rubbish and refuse; the providing and care of sufficient cuspidors and by keeping the working places scrupulously clean. Then there is the providing of plenty of sunlight or artificial light if necessary, the installation of modern systems for the filtering, cooling, and distribution of drinking water and the maintenance of clean sanitary up to date toilet and wash rooms, shower baths, lockers, etc. No insignificant part is played by the providing of all necessary protective and safety devices in connection with machinery and by the maintenance of adequate fire protection. The providing of clean sanitary lunch rooms serving the best of food at low prices is greatly appreciated by employees. Recreation rooms, rest rooms and dance floors help relieve the tension of work, when combined with 15 minute rest periods in the middle of the morning and afternoon. School rooms for the younger employees and vocational classes for the older employees held both during working hours and in the evenings, with the addition of a large library, well run, assist many of the ambitious to successful careers. Well kept grounds surrounding the factory, employees club houses, athletic grounds and associations, noon-day and evening concerts, and other means of amusement and recreation speak for themselves as big factors in welfare work. Of course welfare work pre-supposes reasonable hours, but the giving of vacations with pay, the supervising of vacation saving funds, and the providing of rest farms and other places for spending vacations at a reasonable outlay are features which are looked upon favorably. Investigation has revealed that the lowest ebb in efficiency is at around 10 a. m. and 3 p. m. Many firms assist their less vigorous employees at these periods by the serving free of large glasses of double strength malted milk. In inclement weather employees in some plants are provided with umbrellas on leaving work or are provided with dry stockings and other clothing on arriving at work, which is greatly appreciated by those in need. A great boon and money saver is the giving to the employees gratis the benefit of the services of the company's Legal Department or the formation of Legal aid societies among the employees. The free services of an oculist are very acceptable. Who would not express sincere appreciation upon the receipt of groceries and other household needs at a time when the

head of the family had his income stopped or greatly lessened by sickness or other misfortune? Who can tell how many girls or men are helped thru trying positions by the kindly human advice of the welfare head or her assistants? A little thing but one of great thoughtfulness is letting girls out 10 minutes before closing time, thus avoiding the rush and giving them an opportunity to get seats in the cars for the usually long ride homeward, in a large city. Another great feature of welfare work is the provision for the employees' future as well as his immediate subsistence by disability payrolls, by pensions, and by benefit associations. Free insurance to employees, and death benefits, have kept many a dependent from the poorhouse. But probably the part of welfare work that is most important of all and the part we are more interested in is the provision made for medical assistance, emergency hospital and sick rooms, free medicines, preliminary medical examinations and periodical medical examinations, of all employees; the maintenance of sanitariums and the providing of a social service agency for home observation, with visiting doctors attending the sick in their homes and visiting nurses aiding the families as only visiting nurses can aid them.

From the above resumé we see that welfare systems comprise the organized efforts of employers to render service to their employees above the payment of wages.

The manner in which much of this help is given is very important. Many employers have learned to their discomfort that welfare work superimposed on employees in a patronizing manner as too free and obvious a charity and which therefore fosters the spirit of dependency, does not yield satisfactory results. The employer must be willing to recognize that his employees are human beings, worthy of his respect and not unable to respect themselves.

The employer should not give his help as a gratuity—the employee should not demand it as a right. If it can be given so that loyalty to the firm as well as self-respect may be maintained, nothing but the right sort of appreciation will be felt on both sides.

It must be spontaneous, it must be whole-hearted and it must above all encourage the independence of the employee. There must be opportunity for a large degree of initiative—it must be democratic.

As Montgomery Ward & Co. put it—"The general aim of our

welfare department may be summarized thus:—it is our desire to assist employees thru situations which they are not able to meet themselves, and to give that assistance without impairing their consciousness of individual responsibility and self-respect.”

The broad-minded employer realizes that these forms of assistance are necessary additions to satisfactory wages and not substitutes therefor. Fair compensation for service performed, is the primary obligation of the employer to the employee and adequate wages are after all the greatest guarantee of health and good physique.

It is not necessary to inquire too closely whether industrial welfare work is motivated by desire for profit, by an ideal of national efficiency or simply by human sympathy—a desire to be of more personal service to the employees. Its goal is the health of the worker and one need hardly add that whatever increases the average health of the employee, increases not only the health, happiness and good will of the individual with his consequent good will, loyalty, and devotion to the firm, but also, thru the carrying of this sense of obligation, and sympathy, and interest, from the shop to the home, increases the comfort and happiness of the latter and also of the community. We must not forget to add to all this the consequent increase in the employee's efficiency and productive capacity with the result of increased earnings for the firm. It is a happy moment in the life of a nation which finds so many forces combined in a movement of such paramount value.

An excerpt from one of Montgomery Ward & Company's booklets may be interesting in this connection. “Does it pay? It certainly does. From the standpoint of the firm, it is evidenced by the alacrity with which executives plan for it more and more extensively thru their assurance of its worth from successes already achieved. Of the employees' standpoint the firm can judge of course, only from attitude, from the quality of response, from the reciprocating loyalty that makes itself felt in an all pervasive atmosphere of interest and pleasure in their work, and you just know it's right—that big ideal of Montgomery Ward & Company that is back of it all, for the instillation and fostering of more self-respect, more self-dependence, and the subsequent self realization in every man and woman in the company's care.”

Recognizing that health is one of the prime essentials if not

the first requisite of the efficient worker, that it is the easiest thing to lose and the hardest to regain, the aim is to neglect nothing that will contribute to that condition.

This idea of health comfort and physique has spread very rapidly until we find nearly all progressive industrial organizations directing considerable attention to this problem. It has been conclusively demonstrated that activities along these lines, when properly directed, not only reduce illness and accidents and raise the standard of living, but also give direct results in increased efficiency and production in the work of the factory.

The human body is the most wonderful mechanism ever created and the greatest attention, therefore, should be given to its care and welfare. Nature is patient and long suffering, but she requires a final adjustment of her account. Health is of the utmost importance and so an attempt is made to preserve the body in good condition rather than to cure it after it is diseased. The cure of disease is of great benefit and has its place, but the financial and the human benefits of increased preventive work are far greater. It is significant that a constantly increasing proportion of the activities of health departments are devoted to education in personal hygiene, health, and prevention.

A vast majority of employees need the medical examinations and the advice that necessarily follows them in order that they may be guided away from beginning disease, and incidentally the loss of a full day's pay is not a thing to be borne lightly by any worker.

The aim is to keep them healthy, contented and well conditioned generally and the health program must, therefore, be comprehensive and include the home, as health hazards are to be found here as well as in the shop. This is good humanitarianism and good business combined.

In the resumé of the activities listed under welfare work, a short outline of the work of the medical departments was given. The purpose of the preliminary medical examination is to protect the prospective employees from work for which they are not physically qualified, to detect beginning disease and to protect the employees in the company's service from contagious disease. Periodic examination after employment has for its purpose the preventing of occupational disease, the correction of ascertained minor defects, detection of disease in its incipient stage, encouragement of treat-

ment in suspected serious conditions and the recommendation of treatment where neglected. Periodic examination of employees in the commissary department is especially important as here is handled the food of thousands of people. Sanitariums maintained by the firm enable Tuberculosis, etc., to be treated under the most favorable conditions. The medical dispensary takes care of all cases of minor injuries and minor diseases and ailments such as colds, headaches, etc., and dispenses free medicines. The hospital takes care of major surgical cases and the more serious diseases. Sick rooms and rest rooms convenient to all departments play an important role. Visiting physicians and visiting nurses complete the organization of the medical department. The visiting industrial nurse is described as the interpreter of the employer and employee to each other, the connecting link between the home and the work shop, because of the close personal surveillance and supervision which she exercises, because of the words of kindness and good cheer she carries, and the help and advice she gives in the home.

There is no doubt that this health conservation very definitely improves the productivity and working ability of employees. It makes for loyalty on the part of the working force, reduces the time lost on account of illness, helps to keep employees at work or at least return them to their tasks at the earliest possible moment, and helps to maintain employees at the maximum of physical efficiency.

Welfare work is frequently criticized by those not fully familiar with it, and we sometimes hear the assertion made that "All this foolishness had best be abandoned and the money it costs put into the pay envelope." In answer to this it might be interesting to know that the cost of all these activities by Montgomery Ward & Co. for the year 1914 averaged \$7.14 per employee and for the year 1915, \$8.97. It is questionable whether even a small percent of employees would or could have furnished themselves anywhere near as much service during one year for either of those amounts.

That part of welfare work which has just recently come to the front and which we are most interested in, is the installation of dental offices for the purpose of encouraging and assisting the employees along oral hygiene lines. The reason that Dentistry has come to the front as an aid to health betterment is that only recently has it been conclusively proven and publicity given to the fact that

many general body diseases come from diseased conditions about the teeth. Health being the prime requisite, anything affecting it is given widespread attention by welfare departments and therefore we find that a great number of firms thruout the United States now have Dental Infirmaries and a great many more are contemplating the placing of dentists in their plants. I will now briefly describe the policies of each of the industrial dental infirmaries in the State of Illinois.

SEARS, ROEBUCK & Co., a mail order house employing around 15,000, have a dental infirmary consisting of one chair and outfit in charge of Dr. F. C. Nonnamacker. The general policy of the office is to examine the teeth of everyone in the plant and at the same time give each one a 7-10 minute personal talk on Oral Hygiene. They refer all employees needing dental service to outside dentists. In a great many cases, arrangements are made for the employee to have the company pay the bill in full, and then to pay back the company in small weekly payments. In very needy cases, the bill is paid by the company without requiring the employee to pay anything. All such cases are first investigated by the Welfare Department. New employees with mouths in a very septic condition are practically compelled to get them attended to. The co-operation with the medical department is emphasized, especially in regard to focal infections. Temporary relief is given to all cases of toothache. In the personal oral hygiene talk the dangers of the Dental Quack are pointed out. The employees as a rule are not allowed to go to outside dentists on the company's time. The whole aim of the office is to act in an advisory capacity to employees in regard to Dental needs.

HART, SCHAFFNER & MARX, clothiers, employ about 10,000 with around 2,000 in the building in which is located their Dental Infirmary. This consists of one chair and outfit and is in charge of Dr. Grace M. Long, who has associated with her Dr. F. M. Butler.

The services rendered, consist of extracting, treating, prophylaxis and amalgam fillings. No gold work of any kind—fillings, crowns, or bridge work, is attempted, nor any plate work. This is all referred outside. The employees are charged a nominal rate for the actual time they are in the chair while actual work is being done but all emergency work, stopping of toothaches, examination and advice on oral hygiene, etc., is given gratis. This teaching of

oral hygiene by personal contact gives results that can be obtained in no other way and it is emphasized that it includes a campaign against dental quacks. All work is done on the company's time without loss of pay to the employee. Neither the examination nor the work is compulsory as yet and the response has been such as to satisfy the management that the office is now an indispensable adjunct to its welfare work.

It might be here mentioned that in the case of employees very badly in need of dental service and whom the welfare department has investigated and found to be unable to pay for same, the company itself stands the necessary expense.

THE INTERNATIONAL HARVESTER COMPANY at their McCormick Plant employ around 12,000. They have a Dental Infirmary consisting of two chairs with complete outfits including an X-ray equipment. The office is in charge of Dr. R. I. Humphrey who has associated with him Dr. E. J. Bostik. The policy of the infirmary so far has been to examine every employee, make records of the needs of each, do some extracting in bad cases to put the employee's mouth in a more healthy condition, and to do some prophylactic work in bad cases, which latter is more for demonstrative purposes than anything else, as along with this a personal Oral Hygiene talk is given. Dr. Humphreys emphasizes the fact that it is compulsory for the employee to hold a large mirror in his hand from the time he enters the office until he leaves it—as the old adage is—"seeing is believing." The worst cases are told to return in one month to see if they are following the advice given. All employees suffering from toothache are tended at once so that they can go back to work without losing any more time than is necessary. A small amount of plate work is done for old employees with large families who are in poor circumstances. All broken bridges, teeth broken off plates, and any other injuries to the teeth that are the result of an accident while at work are taken care of at the office. No work is done for the families of employees. Everything done in connection with the office is absolutely and unconditionally free. Practically none of the general dental operations are done for the employees except in exceptional cases. All needing work are referred to outside dentists, altho it may be that this policy will be changed upon the completion of the examination of all employees.

THE INTERNATIONAL HARVESTER Co. at their Deering Plant employ around 6,000 and they have a one chair office under the direction of Dr. W. H. Parker. The general policy of this office is the same as the office of the McCormick Plant.

ARMOUR & COMPANY, PACKERS, employ around 10,000 and have a dental infirmary of one chair and outfit in charge of Dr. Frank A. Hoyt. At present the policy is to go thru the entire plant making and recording an examination of each employee's mouth and at the same time extracting all septic teeth and giving a personal oral hygiene talk. They are referred to outside dentists for any needed dental work. Emergency toothaches are relieved at once so that the employee will lose no time for his work. Employees badly in need of dental service and not able to pay for same are referred outside and have the bill paid by the company. A peculiar situation exists at this plant on account of so many employees being foreigners of the most ignorant class and not able to speak English, which makes oral hygiene education difficult—to say the least.

MONTGOMERY WARD & Co. is a mail order house employing around 6,000. They maintain a Dental Infirmary consisting of five chairs with complete outfits. Your essayist is in charge and he has associated with him Drs. F. H. Murrin, R. H. Marks, P. W. Smith and W. E. Mathison. You see that Montgomery Ward & Co. have entered upon this phase of welfare on a large scale, with the broader policy of doing for their employees actual reparative dentistry in all of its branches, except Orthodontia. Nothing in connection with the office is compulsory yet. It has built itself up thru merit and good service from one chair to five and during the last winter months even five operators could not take care of those in need and the result was a waiting list of over 400. The examination of teeth and oral conditions, relief of emergency cases of toothache and all advice and instruction along Oral Hygienic lines is given free of charge. This latter instruction is considered a very important part of our work and the personal talk to the employee is what we find gets the results. I might emphasize here that we spend a great deal of time trying to educate the employees regarding the detrimental practices of the dental quack, as a large percentage appear to have patronized these charlatans of the Dental Profession. All reparative work is charged for and this charge is

ostensibly the actual cost of the service rendered—but in fact, it is below cost as no overhead, rent, heat, or light expense is charged against the dental office—only the dentists' time and material used. All work is done on the company's time, during working hours, and the employees are paid for their time while in the dental office. No work is done for the families of employees and no one is asked to have his work done in the company's office. If the employee has his own dentist we invariably advise him to have his work done there rather than at our office. One of the features of Dental education is the posting of bulletins on oral hygiene and the importance of the care of the teeth, etc. Oral Hygiene articles are also frequently inserted in a small newspaper published by the House. In all of the work the aim is to co-operate with the medical department whenever and wherever it is possible in diagnosing and treatment, and the cause of many cases of continued temperature, rheumatism and neuralgia, etc., has been traced to the teeth.

Employees of small means are enabled to have a great deal of work done and pay for it by small weekly payments.

Employees in dire need of dental service whose financial condition is such as to prohibit the smallest payment, if found to be worthy by the Welfare Department, are given the required service gratis. In all such cases, the home conditions are investigated by visiting nurses of the Welfare Department.

The employees are practically unanimous in their expressions of praise and good will toward the Dental Department and its beneficent services.

An article describing in detail the Dental Service at the Chicago plant of Montgomery Ward & Co. appeared in the DENTAL REVIEW for May, 1917.

A few have criticized the policy of doing all branches of dentistry but the company feels justified on account of the poor work of cheap dentists, and the fact that the fees of good dentists are almost prohibitive to the average workman. The Infirmary aims to give the very best service at low cost.

Now that you have been given an outline of Welfare work and its various component activities, and an outline of the policies of all the dental infirmaries to my knowledge in the industries of Illinois, you can readily see the relationship of the two and how the latter are almost an indispensable addition to the former.

A word might be said here regarding the relationship of this work to the outside dentists, to the general profession, but I will leave that for the discussion. Suffice it to say here that the industrial dental office is probably one of our greatest factors in the teaching of the fundamental truths of Oral Hygiene, and in the preaching of the evils of the dental quack.

And what of the future of this work? It will in all probability be governed by the attitude of the Dental Profession. It might be said however, that a growing interest in this subject is manifested on every side, especially by the social worker interested in new developments affecting community welfare, and that more and more progressive industrial corporations are beginning to feel the need and see the advantage of engaging in work of this kind.

PORCELAIN TECHNIC*

BY GEORGE A. THOMPSON, D.D.S., CHICAGO, ILL.

(Director, Department of Ceramics, Columbia University Dental Graduate School, New York.)

Mr. President, Members of the St. Louis Dental Society, Ladies and Gentlemen:

Words cannot express the pleasure I feel in appearing before you to present a subject so dear to me.

Porcelain technic is and always has been the most sadly neglected branch of the dentistry. The list of finished porcelain workers is very small. Why? Because the men who teach, or are supposed to teach it, fail to properly equip themselves, or the schools are financially unable to give them the proper support.

This, however, is a matter of history. The new four-year courses will permit of more advanced work and porcelain technic will be added to the curriculum of every dental college worthy of the name and will receive the attention it deserves.

So earnest have been many men in the profession to gain this knowledge that they have tried to explore the subject unaided. But, unfortunately, the literature on the work is scattered and antiquated. After a time their enthusiasm died, because of failures—the furnace was disposed of or stored away on the top shelf. (Some, I hope, will be dusted off and used in the near future.)

*Read before the St. Louis Dental Society.

Porcelain has its place in dentistry—its position is so high that I firmly believe nothing will ever take its place. Those who differ with me cannot be familiar with its possibilities. Let this seed sink deep in the minds of everyone. The graduates of reputable schools three or four years hence will be men of higher caliber, able to do first-class root canal work, artificial plate work according to the new and accepted theories; removable bridge work, correctly constructed, and last but not least, good porcelain work. In short, they will have a good start in dentistry along correct lines and will differ from the poor unfortunate of the past, who at his best can compete only with the advertising dentist and a very weak competition at that. The exception is the young man who is aware of his limitations, who cultivates the friendship of men in the profession who can help him, attends every dental meeting he possibly can, subscribes for all the dental journals and books which will be of assistance to him, and applies his time to them, as few men do, while at college.

This means that every man who is awake to the situation in dentistry must now lay his plans to better himself and his work or be relegated to the rear where he belongs.

The competition of the young dentist of the future cannot be ignored, as in the past. He will have new and better methods than is commonly found in the average office today. The general public is well informed on dental subjects, and they are very quick to understand and appreciate these new methods. If the men now in practice who do not understand how to render service of equal merit will not prepare themselves, they will fall by the wayside.

COLOR, THE CHIEF OBSTACLE, AND ITS SOLUTION

Unless I can show you how to broaden your sense of color selection, color reproduction will be of little value.

Color and not tooth anatomy is the barrier between the beginner in porcelain work and success. Most dentists have had instruction in dental anatomy, but few understand even the theory of color. Color is a science to master which one must give time for study and for laboratory experiments. Without a clear understanding of its principles, no one should hope to mix haphazardly and reproduce colors accurately.

This subject is a matter of more difficult acquirement than that of form, which can be measured. The anatomical structure of the tooth may be observed. The effect of color has a direct influence

upon the individual—it stimulates or it depresses. Have you never had the experience, upon entering a room, when something about the carpet, curtains or wall decorations affected you one way or another? This is just a hint as to how to apply this science. A patient first enters our reception room, which should receive careful consideration, as the mental attitude of the patient a few minutes later will influence the operation.

To be able to distinguish color is a matter of careful education. Children in the schoolroom are taught it by the use of colored papers; at first there are many mistakes, but later they learn the

The system of color depends upon physical measurements made by special color apparatus. Much confusion of color is caused by the inability of most people to express themselves in more than two dimensions, an appreciation of which can be had when, in the study of color nomenclature, we find a classification of names for more than four hundred greys. Unless we study this subject carefully all our sensations are included in the color solid and none by its scale of hue-value and chroma.

Hue is the name of a color. We thus distinguish one color from another, as red from yellow. Value is the light of a color (also called tints or shades). Shade, as we use it, means any color or combination of colors. It is the quality by which we distinguish a light color from a dark one. Chroma is the strength of a color, distinguishing a strong color from a weak one.

Everyone should study color and start with the understanding that the Brewster theory of red, yellow and blue “primary” colors is false. Years ago the element of color vision was proved to be red, green and violet-blue. In spite of this fact, a new text book on dentistry, quite generally used, contains a chapter based on Brewster’s theory. He goes on to name false, complementary colors, any of which, if measured on the Maxwell wheel, will not unite to give a balanced neutral color.

Red has for its true complement blue-green.

Green has for its true complement red-purple.

Violet-blue has for its true complement yellow.

Something is radically wrong when we find that men long in practice use from one of three shades in every case. So many have expressed themselves to me that shade so-and-so blends nicely in

nearly every mouth. I do not think that all of these are color-blind, as the law of average would not permit of their number. The future will see color standardized. It will be taught in all schools and we shall have definite symbols to express ourselves. Colleges of color will be established where those who wish to specialize in the arts and crafts will secure the proper training.

In the fine arts, the textile manufacturers, even the printers are giving considerable attention to this matter. It is the only means by which the knowledge of color will live.

In the past we find, in the study of art, that entire schools and ages excelled in color, while in other schools and ages, it is almost entirely lacking.

An appreciation of the value of a color standard is realized when we attempt to reproduce or identify a color by the meager description of light, dark or medium gray. It would convey about as much information to a color expert, as if we go to an architect and ask, "How much is a house?" A standard name or number would immediately identify the color by reference to the color guide if we had one.

A book by Robert Ridgway, "Color Standards and Color Nomenclature," was produced to standardize the names of colors of birds, etc., and it could be used in our work.

ROBERT RIDGWAY'S SYSTEM

This book includes fifty-three colored plates and eleven hundred and fifteen named colors. The arrangement of these colors is the solar spectrum, with its six fundamental colors and intermediate hues, augmented by the series of hues connecting violet with red, which the spectrum fails to show. Mr. Ridgway gives the following explanation: If, with the red-violets and violet-reds thus added to the spectrum hues, the band forming the scale be joined end to end, a circle is formed in which there is continuously a gradual change of hue, step by step, from red through yellow-orange and orange-yellow to yellow; yellow through green-yellow and yellow-green to green; through blue-green and green-blue to blue; blue through violet-blue and blue-violet to violet; and violet through red-violet and violet-red to red—the starting point—with intermediate connecting hues. In the solar spectrum both prismatic and grating, but especially the former, the spaces between the adjoining distinct colors

are very unequal; therefore, for the present purpose an ideal scale must be constructed, so that an approximately equal number of equally distinct connecting hues shall be shown.

Distinctions of hue appreciable to the normal eye are so very numerous that the criterion of convenience or practicality must determine the number of segments into which the ideal chromatic scale or circle may be divided in order to best serve the purpose in view. Careful experiment seems to have demonstrated that thirty-six is the practicable limit and accordingly that number has been adopted.

If the number of intermediate hues were equal in all cases, there would in this scheme be five between each two adjacent fundamental colors of the spectrum, but a greater number of recognizably distinct hues is obviously necessary in some cases than in others; for example, spectrum orange is decidedly nearer in hue to red than yellow, and, therefore, the number of intermediates required on each side of the orange is different, being in the proportion of four for the red-orange series to five for the orange-yellow, and similarly six are required for the violet-red series, while four suffice for the blue-violet hues.

There is no known means by which we can measure the proportion of two or more pigments in any given mixture, "because color effect cannot be measured by the pint of mixed paint or the ounce of dry pigment," but, fortunately, we have a very exact method in the color wheel and Maxwell discs, by which the relative proportions of two or more colors in any mixture may be precisely measured. This method has been used in the painting of every one of the 1,115 colors of Mr. Ridgway's books, by means of one disc to represent each one of the thirty-six colors (both pure and "broken"), together with a black, a white and a natural grey disc, the last being a match in color to the ray, resulting from the mixture of red, green, and violet on the color wheel; the neutral grey disc, however, being used only for the making of discs for the broken series of colors and for the scale of neutral greys. These colored discs are slit in one side from center to circumference, and, therefore, interlocking two or more, they may be adjusted so that either occupies any desired percentage of the whole area, which may be very precisely determined by a scale of one hundred seg-



Solar spectrum from a diffraction grating.



Solar spectrum from a prism.



Study of spectrum colors.



D

D — Correct primaries, red, green and purple-blue. Correct secondary or complementary colors, yellow, blue-green and purple.

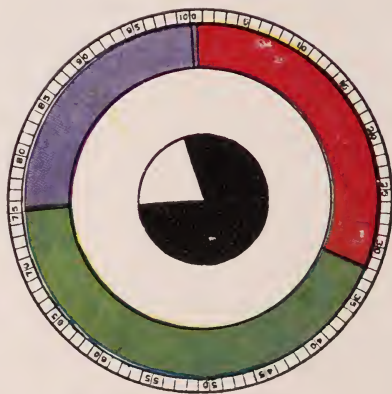


E

E—False color-balance. Primaries, red, yellow and blue. Secondaries, orange, green and purple.



Showing how thirty-four different shades or tints can be made by mixing in various proportions, red, yellow, blue and white.



Maxwell Wheel.

Green. By mixing in various proportions of white.

ments shown on outer edge of a larger disc, on which the colored discs are superimposed.

When connected with the color wheel and adjusted as may be desired and then rapidly revolved the two or more distinct colors resolve themselves into a single uniform composite color, whose elements are shown in their relative proportion by the scale surrounding the discs. It should here be explained that the first twelve of the fifty-three plates in Mr. Ridgway's book show the pure full spectrum colors with four different tints of the same colors above them produced by adding 9.5, 22.5 and 45 per cent., respectively, of white, while below the pure colors are four specimens of shades obtained by adding 45, 70.5 and 87.5 per cent. of black, the remaining plates show the same thirty-six colors of hues in exactly the same order and similarly modified (vertically) by precisely the same progress increments of white (upward) and black (downward), but all the colors are dulled by admixture of neutral grey; the first series containing 32 per cent. of neutral grey, the second 58 per cent., the third 77 per cent. and the fourth 90 per cent. The last three plates show the six spectrum colors (also purple, the intermediate between violet and red) still further dulled by admixture of 95.5 per cent. of neutral grey, these being in reality colored greys; to which are added a scale of neutral grey and one of carbon grey, the former being the grey resulting from mixture of three primary colors (red 32, green 42, violet 26 per cent., which in relative darkness equals black 79.5, white 20.5 per cent.); the latter being the grey produced by mixture of lamp black and Chinese white and the scale a reproduction of that in Mr. Ridgway's first "Nomenclature of Colors." It should be emphasized that in all cases, except the scale of carbon greys, only the discs representing the middle horizontal series of colors (both pure and broken) have been used, in combination with a black and white disc, respectively, to make the colors of the vertical scales of tints and shades.

THE CHOICE OF NAMES FOR COLORS

Mr. Ridgway gives the following useful remarks on this subject:

The prime necessity is to standardize both color names and colors by the elimination of the element of "personal equation" in the matter. In no other way can agreement be reached as to the

distinction between "violet" and "purple," two color names quite generally used interchangeably or synonymously, but in reality belonging to quite distinct hues, or that any other color name can be definitely fixed. Various methods of handling the matter of color in zoological and botanical description, etc., by the avoidance of color names and substitutions, therefore, of symbols, numerals, or mechanical contrivances (as color wheel and spectrum analysis, color spheres, etc.), have been devised, but all have been found impracticable or unsatisfactory. The author has taken the trouble to get an expression of opinion in this matter from many naturalists and others and the preference for color names very greatly predominates; consequently, whenever it has been possible to find a name which seems suitable for any color in this work, it has been done, leaving as few as possible unnamed, and for these some other means must be devised for their designation.

Even the standard pigments are not constant in color, practically every one of them being subject to more or less variation in hue, or tone; different samples from the same manufacturer sometimes varying to the extent of several tones or hues of the present work; indeed, in every case where two or more samples of the same color have been compared, it has been found that no two are exactly alike, the difference often being very great. For example, of five samples of "Vandyke brown" only two are approximately similar, each of the other three being widely different, not only from one another, but from the other two, one being a blackish brown, another reddish brown, the third a yellowish orange-brown. Of eleven samples of "olive" no two are closely similar, the color ranging from the shade of dull (greyish) blue-green to orange-brown, dark brownish-grey, and light yellowish-olive; and the same, or nearly the same, degree of variation is seen in absolutely every color examined, showing very clearly the utter worthlessness of color name unless fixed or standardized.

This same variation will also follow in the porcelain that is furnished by the various manufacturers, but in a less degree. To overcome this point I buy in large quantities.

Education in this line begins when we recognize the names of certain hues, as red, yellow, green, blue and purple. Red is the color most individuals easily recognize—even savages recognize it and have a name for it. Distinction of color is slow at first. The most

notable contrasts are recognized, but the more delicate colors are lost. After a time spent in exercise and experimental work the delicate colors will be more easily appreciated. The more time one spends in this work the more interest he will take in it and will apply his knowledge in many different ways. When this subject is mastered every color can be recognized, named, matched and imitated.

The first step is to study the theory of color and master its principles. Then mix porcelain as supplied by the manufacturers in various proportions with a pure white, carefully record and keep the buttons; follow this up with the various colors mixed in the same way. Next study the physical nature of light—how it travels, the absorption, refraction and reflection of light on different surfaces. Take a central incisor root preparation on a model, wrap three platinum matrices for the same root. Bake a gingival color of, say, shade five, carefully measure the porcelain mesio-distally, labio-gingivally and inciso-gingivally, have the measurements the same on all three. Then add, say, shade fourteen, as the incisal color measure as before and have all three identical. After they are baked they would match accurately, as all three were made over the same root preparation on the same model. All three were baked together, each color was carefully measured as applied, they will be as near alike as it will be possible to make them. Take one and disc it as smooth as you can with paper discs. Mark one of the others with fine stones and a diamond-point, have the surface markings running mesio-distally. The third one mark in the same way, but have the markings run inciso-gingivally. Wash with spray bottle and compressed air, place all three in the furnace and glaze. The result will be three different shades due to the action of light on the surfaces. The crown with the smooth surface will be much the lighter due to the fact that it will reflect a solid beam of unbroken light. The prophylactic specialist who carefully polishes the enamel surfaces of the teeth takes advantage of this fact unconsciously. The patient believes the change is due to the removal of deposits and other material, but the fact is the change is due to the changing of a roughened surface to a highly polished smooth surface.

When I started to experiment with orange porcelain I had a special orange and pure white or colorless porcelain made. I carefully weighed and mixed the porcelain in an agate mortar and

pestle, baking samples of each mix. The first mix was .02 white, .98 orange, the second .04 white, .96 orange, etc., until I had fifty specimens. By using one of these for a gingival color I can accurately match any gingival color. I firmly believe that the color spoken of in dentistry as yellow in describing artificial teeth is not yellow at all—but orange. The results I have had will bear this out. Other men in this same line of work are of the same opinion.

Expert porcelain workers can take six or seven colors and by various mixing reproduce quite accurately. But the beginner will find himself lost in the forest of doubt if he attempts it. We might say, take so much of number one, two, etc., by weight and mix—but this would necessitate the use of a balance scale to accurately weigh out and an agate mortar and pestle to thoroughly incorporate it. Then the danger of mixing in particles of dust and other impurities, which cause the bulk of trouble for the inexperienced. Few men would take the trouble to carry out the proper precautions—a guess as to the weights with incomplete incorporation would give the results we too frequently see.

The Justi high-fusing porcelain is the first step to set a standard of colors for the porcelain worker. The colors are accurate and are to be used without mixing.

The chart furnished gives accurate directions as to what color and where to use it.

To illustrate the use of the shade chart:

Shade No. 13, according to the shade guide, matches the case. Reference to the guide chart shows No. 4 is the body and is placed on the platinum matrix in the position that would correspond to the dentin in the normal teeth, except in the gingival third, where the full enamel contour is made. The balance is then built to full tooth contour with No. 13 and the result will be a perfect reproduction of shade No. 13. The gingival third will have the full body color; the incisal third the full enamel color and the middle third a perfect blend due to the thinning out of the enamel color as it is worked to the gingival.

To illustrate variations from the chart:

Numbers 4, 5, 6, 21 and 23 are the body colors to reproduce any shade on the guide. If, in selecting your shade, say No. 13 is good, but a trifle light at the gingival, the next darker body, or

No. 5, could be used. In combination with No. 13 enamel it would result in a shade No. 13 slightly darker at the gingival.

The enamel for shade No. 7 is a pure white and could be mixed in any combination to dilute a color.

MAKING YOUR MONEY EARN MONEY—SAFELY.

A SERIES OF ARTICLES ON THE CONSERVATION AND INCREASE OF
SAVINGS.

BY GEORGE LEE McCANDLESS, CHICAGO, ILL.

ARTICLE III—RULES TO FOLLOW IN BUYING BONDS.

In two previous articles the writer has attempted to establish the proof that Investment Bonds offer the best form of sane investment. The question of selection will now be considered.

It should be expected of a sensible man, that he should go to a dentist if he has a toothache. It should also be expected of a sensible dentist, that he should go to an investment banker if he wishes to buy an investment bond. It would seem the part of wisdom for the man with a toothache to go to a dentist in whom he has confidence. It certainly is the part of wisdom to only purchase investment bonds from bankers worthy of confidence. There are quacks in all walks of life. Therefore the first rule to follow in buying bonds, is to consult with an investment banking house of known integrity and reputation.

Just as there are many ways in which teeth may be filled, so are there many different bonds possible to select. Just as dentistry may be made to best conform to the requirements and needs of the patient, the selection of bonds may be done so as to meet the requirements of the investor.

The income of the professional man ordinarily fluctuates from month to month. It can usually be expected that there will come periods of quiet. Also collections may be slower at one time than another. It would therefore be well, it would seem, for the professional man to keep his investment account liquid. He should always have something from which cash could be realized on short notice. Furthermore, the investor naturally does not want to realize a loss in such a case.

An investment account may be kept in a state of liquidity by a diversification of maturities. Good bonds can usually be found

whether the purchaser desires some coming due in a few months or many years hence. Of course, a bond maturing in a few months will not ordinarily yield as attractive an income as one which has many years yet to run. Such short time securities can usually be purchased at about prevailing money rates or a little less. Nevertheless, although the interest return should be low, such bonds should be considered by the man wishing to keep his funds in liquid shape. At the present time money rates are high. Therefore, short time maturities may be found, which will unquestionably be paid when due, and which will yield from 5 to 7 per cent.

In addition to short time obligations, certain long time bonds should also be considered for permanent investment. Good bonds, which have a long time to run, can ordinarily be found to yield from 5 to 6 per cent. At the present time such bonds can be found to yield a higher rate than this. A certain high-grade railroad mortgage bond is at present selling at about 70. As the coupon rate on this bond is 5 per cent, this means that the yield is about 7 per cent—and there is the probability that the bond will sometime sell much closer to par and an additional profit can be realized. The element of liquidity can be obtained to a better extent in some long time bonds than in others. Some are very well known and actively traded, and a market can generally be found at all times. The distinct advantage in buying certain long time bonds, in a time like the present, lies in the fact that an unusually high yield may be derived—and that this yield will continue through a long time to come. Bonds, which in an ordinary market sell at about a 5 per cent basis, may now be purchased to yield 7 per cent or better. This means that, when the ordinary market returns, these bonds will still yield the 7 per cent or better.

The question might be asked as to how diversification of maturities could be considered where the total amount invested is small. In case the total invested funds of an individual should amount to a thousand dollars or less, the short time maturities alone are recommended. At maturity, such funds can easily be reinvested if not needed. By a short maturity is meant from six or eight months to two years. The thousand dollar bond is the denomination most actively traded in and, therefore, that unit is recommended. For the investor having several thousand dollars, diversification of investments, as well as maturities, should be considered. A geographical distribution should prove a better safeguard than confining one's interests

to one locality, where an adverse condition might affect the owner's entire holdings otherwise.

The man of very modest means is not prevented from investing in bonds. Small denominations are usually obtainable. Also, for this type of investor, most of the best bond houses are willing to start him with an investment account. A leading Chicago banker claims to have laid the foundation of his fortune in this way. He would select a bond in a thousand dollar denomination, pay down one hundred dollars and the balance at the rate of seventy-five dollars per month. Then at the end of the year, he would own a thousand dollar bond paying sixty dollars interest per annum or five dollars monthly.

In selecting a bond, the investor should satisfy himself on certain points. The most important of these is the management of the borrowing company. Is the management conservative? Are patents, good-will, trademarks and other intangible assets carried on the books at a good round figure? Some of the largest companies do not figure these things as worth anything, though in reality such assets may be worth millions. Are substantial sums charged off yearly for depreciation? Has the company a good supply of working capital and a good surplus? Is it heavily indebted? The foregoing are some of the questions which will determine efficient management.

It should be borne in mind that the purchase of a bond is simply the lending of funds to the issuing company. The purchaser of a bond should therefore satisfy himself that he is willing to lend his money to the company. It would seem safer to lend money to a well established enterprise which satisfies a public necessity than to some new or small company in a speculative position. The question of security is a good one to consider but the history of a great many companies will indicate that foreclosure to obtain satisfaction of their debts is a remote possibility.

A technical discussion of the elements of determining the position of investment bonds will not be attempted. When a man goes outside his sphere he is interested only in results. A patient does not care about the science of making an inlay if he has confidence in his dentist. All he wants is a good filling and he knows, if the dentist is all right, he will get what he wants. An investor will get what he wants if he goes to a reputable bond house. Good investment bond houses are no harder to find than good dentists.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

The regular meeting of the Chicago Dental Society was held in the University Building, Tuesday evening, December 18, 1917, President Idler in the chair.

Dr. R. E. Hall read a paper on "Retention of Full Dentures."

DISCUSSION.

DR. J. H. PROTHERO:

Mr. President and members of the Chicago Dental Society. The essayist has occupied a good portion of the evening and covered a wide field in his essay and subsequent stereopticon lecture.

Owing to the fact that I received the paper this afternoon, too late to read it fully, and further, was not favorably seated in the hall so as to hear distinctly I will not undertake to fully discuss the subjects presented. There are, however, three or four points of importance I want to discuss after which I will give way to others who have had an opportunity to study the paper more carefully than I was able to do.

First, in regard to the illustrations thrown on the screen in reference to anatomic occlusion, but of which nothing was detailed in the paper, I have this to say: If the arrangement of teeth as shown tonight represents "anatomic occlusion" then I don't know the fundamental principles of this subject.

If any of you gentlemen will examine the mouth of a patient whose occlusion is normal and will have him bring the lower against the upper teeth as in the initial act of mastication, you will find that the mesial and distal slopes of the various cusps representing the buccal marginal ridges of the lower and upper teeth are in comparatively close contact. The lingual marginal ridges of these same teeth, although relatively close do not show as uniform contact as do the buccal marginal ridges.

This is Nature's method of preventing the escape of food into the buccal cavity and allowing it to enter the lingual cavity in masticatory effort. The illustrations presented, representing dentures occluded anatomically are wrong as any one of you who will examine a normal, natural denture will find.

Regarding the normal lip line, the essayist requested that if

any one were present, whose teeth were in occlusion when the mandible was in a state of rest to make the fact known during the discussion. I am one person, who when reading, studying, or in a state of comparative relaxation hold the lower lightly against the upper teeth the greater portion of the time, and with no conscious muscular effort or sense of fatigue. Moreover in those cases where the teeth are slightly parted, the separation will seldom equal one-fourth and is usually less than one-eighth inch. Such slight separation of the teeth would produce scarcely no perceptible change in the external portion of the mouth or the lips from what would be seen were the teeth in contact and the labial muscles not contracted.

Perhaps those at a distance cannot see but I ask those near me to notice my mouth. I will bring the teeth in occlusion and close the lips and afterward separate the teeth about one-eighth inch, still keeping the lips closed. Did you notice any change, Dr. Dittmar?

DR. DITTMAR:

Very little.

DR. PROTHERO:

Making a point of importance of this is not worth while since the rule criticized is a very close approximate guide while the esthetics of each individual case determines the exact length of occlusion rim or incisal position of the teeth.

The method of taking impressions as described by the essayist is a most excellent one in many cases, all due credit for which should be given him.

The value of this method and the underlying principle involved consists in securing an accurate impression of all the peripheral muscles in a state of rest or under but slight compression.

The peripheral margins of dentures moulded over a cast secured from such an impression, coming in contact with the muscles afford stability by sealing against the ingress of air during masticatory effort.

This fundamental principle is not new. A number of years ago Dr. Ames suggested and demonstrated the importance of utilizing muscular peripheral contact of dentures to guard against the ingress of air and thus develop maximum stability.

This also, is the underlying principle of Dr. Greene's method

of impression taking and with which many of you are familiar. The methods advocated by Mr. Supplee accomplish the same result.

I must plead guilty, in a number of cases in the past, to having corrected imperfect plaster impressions by refilling and again introducing in the mouth, but have never advocated it. Recently in some cases I have adopted the method suggested by the essayist with most excellent results.

The method I have generally followed in securing a plaster impression is to take a preliminary impression in wax or modeling compound in such manner as to avoid muscular impingement. This was then trimmed and refilled with plaster of medium thin consistency and again introduced, instructing the patient to exercise the labial and buccal muscles slightly, to guard against undue displacement. This method also seals against the ingress of air peripherally, in the finished denture.

The statement was made that there are no anatomic forms of teeth, which is true, but the products of the manufacturers have been very much improved in recent years. It is, however, no wonder that the essayist is obliged to grind teeth so extensively in the finished denture or in arranging them on the articulator illustrated, the center of rotation of which is from an axis extending from above downward and backward through the center of the cranium.

The centers of rotation of the mandible are not located in the median line of the cranium as can easily be seen by examining the human subject or skulls. I have anatomic specimens in which the glenoid fossae are deep, with overhanging margins, and showing very little space between the condyles and the fossae walls. In the living subject this space is filled with interarticular fibro-cartilage and tissue. The condyles in such case would move one downward, forward and slightly inward, the other outward, downward and usually slightly forward, or in some cases, slightly backward. Upward and backward movements such as registered by the articular illustrated are rare if not impossible.

There are no perfect anatomical articulators. The snow frame is not absolutely correct, neither is the Gysi, yet in my opinion the Gysi Adaptable articulator comes nearer imitating mandibular movements than any other yet devised.

I should like to discuss the arrangement of the teeth, but am

sure both Dr. Dittmar and Dr. Goslee have something of interest to say, so will gladly yield the floor to them.

In closing will say that while I have used modeling compound for many years in full cases, practically following Dr. Greene's ideas and with most excellent results, yet I think that the method of plaster impression work suggested by Dr. Hall is most excellent and in some cases will yield better results than will compound. However, I still adhere to the use of modeling compound in many instances and believe it has an equal place with plaster in impression work.

DR. HART J. GOSLEE:

Mr. President, Ladies and Gentlemen, and Dr. Hall: Up to the time Dr. Prothero arose to speak I was wondering to myself how the presentation of Dr. Hall's paper could possibly be discussed, because from my viewpoint it seemed so clear to me that there was nothing discussible about it, so to speak, but to agree with him. I was quite glad and not entirely surprised, therefore, to find that Dr. Prothero could scientifically discuss the paper and find therein something in which he felt called upon to disagree with Dr. Hall. I want to assure you in the beginning, however, that I shall make no effort whatever to discuss Dr. Hall's paper from a purely scientific standpoint, but shall confine the few remarks I have to make more particularly to the practical application of the theories presented by him.

All of you know that no scientific theory is of very much value to any of us unless we can make use of it, or unless in our minds it will serve a purpose, and, if you please, appeal to us as being practicable. To begin with, I want to say to you that in my opinion this particular phase of prosthetic dentistry in the past has been both practiced and taught along the most empirical lines imaginable, and upon lines more empirical, I believe, than has any other phase of dentistry. Indeed, as I see it, I believe that the general principles underlying the application and construction of artificial dentures and the methods of practice and of teaching this specialty, have progressed less in the last fifty years than any other phase of dentistry up to the present moment. Therefore, I take it as high time and quite opportune, and for us fortunate, that Dr. Hall should appear on the scene just at this particular time. I rather question in my own mind if it might have been possible for anyone

a year or two ago to have been the means of bringing an audience of this size, so large a majority of whom remained to this length of time, to hear a paper upon the subject of artificial denture construction, and I am wondering as I stand here why such a thing is possible even tonight. Do you know that of late years I have often thought that soon there would be no further use for the mechanical dentist. Preventive dentistry was certain to come, more teeth were being saved and fewer lost, and therefore it was only a question of time, perhaps within the lifetime of my own generation, when there would probably be no further use for the prosthetic dentist. But as it looks today, judging from the number of teeth that are now being extracted every day, and the general condemnation of pulpless teeth, that not only shall prosthetic dentists be always needed, but also we shall always need specialists in full denture construction. If this is true, and if we are to need the specialist in full denture construction, I believe that those of us who wish and desire to best serve our patients, our profession, and ourselves have but to study and follow the principles laid down by Dr. Hall tonight, notwithstanding, and with due reference to, the remarks made by Dr. Prothero.

I said a few moments ago that theories have no value to us unless we can apply them and make use of them, and I am going to say to you now that since I first learned of these theories of Dr. Hall's, I have been able to apply them and to make use of them in a manner which was amazing to me, while on the contrary, such has not been the case with previous theories and methods which have been handed down to us. As a teacher of prosthetic dentistry for a number of years I have found it necessary to keep myself more or less informed in the progress of the subject which I have had the honor of teaching. In my very early days I became enthusiastic over the theories promulgated by the late Dr. Bonwill and tried to apply them, but only with indifferent success. I am willing to admit this and also to admit that it was undoubtedly my fault, but nevertheless I was not able to make any practical application of those theories which would be of great every day value to me, and I, therefore, eagerly grasped the improvements which have been made on those theories from time to time since then. Dr. Snow gave us many improvements, progressive in nature, and his work was supplemented by Dr. Gritman, and later on in the form

and types of teeth by Dr. J. Leon Williams, and still later on by the more scientific and generally useful theories of Prof. Gysi, all of which has been of great value to this particular subject, but again, I am free to confess that I have not been able to generally accept, grasp and utilize their theories in my work either as a teacher or in every day practice. In this connection permit me to say that it has never been my custom to teach anything, unless I could use it as a practice, and not alone as a theory. The minute I grasped Dr. Hall's ideas of impression taking—and I want to take off my hat to him for the work he has done along this line—I could see where the average careful man, conscientious enough to want to obtain the best results, could unhesitatingly apply those principles of impression taking and bring about uniformly better results than he could by any other method with which I was familiar. Like Dr. Prothero, Dr. Wilson and many others, I took kindly to modeling compound when it was first advocated and demonstrated by Dr. Greene. The taking of an impression in plaster had always been considered a bit objectionable both to the patient and to the operator, and I fancy that many have grasped at modeling compound as a means of overcoming such objections. I first thought that by following their technic carefully it might be possible that we could improve on the kind of impressions that we had previously obtained for all cases. Hence I used modeling compound for years and tried to use it faithfully, and yet, I am free to say that by far the largest proportion of my success in the adaptation of artificial dentures has been obtained by the use of plaster. I attribute this to the fact that in the use of modeling compound, no matter how carefully you employ it, and no matter how carefully you follow the technic outlined by Dr. Greene and Mr. Supplee, you have a compression or displacement of the soft tissues, and such displacement, if you please, of those soft tissues I do not believe to be advantageous, and in many cases I think to be even a disadvantage. I believe that the best impression to be obtained is the one we get by the use of a material which will not appreciably displace soft tissues, and which will enable them for the most part to remain as nearly as possible in their normal position. Hence my success with modeling compound impressions was more or less indifferent, at least indifferent to such an extent as to cause me to go back to plaster as a general practice, when along came Dr. Hall with his methods, in which he shows us

how to take impressions with plaster in such manner as few of us perhaps ever dreamed before.

By way of emphasis permit me to call your attention just briefly to the method Dr. Hall employs in taking impressions. He uses plaster which of course offers less resistance to the soft tissues in their normal position than any other material, and, if you did not glean it from his paper, let me make it clear that he obtains the impression without pressure sufficient to displace any of those tissues other than to raise the muscles of the lips and cheeks to the normal facial outline. He makes it quite clear that when he has the impression adjusted to position he then has the patient gently close until the lips just touch, and the mandible assumes its normal position in relation to the nose, thus restoring the middle features of the face. They may then exercise every muscular movement without any undue pressure and a denture adapted to a cast made from such an impression must necessarily be so adapted as to insure its support by those tissues when in position.

I think, therefore, that Dr. Hall's method of taking impressions is a most modern and valuable addition to prosthetic dentistry.

There are two other phases of the subject which I wish to refer to but briefly. The "taking of the bite," as Dr. Prothero said, was not dwelt upon in the essay to any great extent, though you will recall that Dr. Hall referred to it later on in showing his pictures and said to you that these large masses—I believe he called them—of wax were useless. I, too, have tried to follow the methods of taking the bite advocated by Dr. Snow, Prof. Gysi, Mr. Supplee, and others, and have met with some success in following their technic, but I believe these procedures are advantageous in just one particular in the act of obtaining the proper relationship of the mandible to the upper jaw. In taking the bite I believe it is only necessary to build a rim of wax upon the lower base plate which will elevate it to a line equal to the length of the lower lip. Now, then, having built the lower base up to this point, how much shall we build down the upper base plate? It should be built down to a line which leaves the lips in normal contact, so that the chin is posed at the proper distance from the nose, thus and thereby restoring the middle features of the face. It has been my misfortune never to be able to utilize the Snow face-bow with any degree of satisfaction or success in taking the bite. To me it has not made it possible

by means of its use than it has been without. I can see but one use to which the face-bow may be applied, and that is in removing the base-plates, in situ, from the mouth, and mounting them upon the articulation.

In regard to these rims of wax built up for the purpose of obtaining the various mandibular movements, following the condyle path, etc., and to be used as a guide in the arrangement of artificial teeth, I am willing to acknowledge that while all of this wax has a distinct advantage in obtaining a normal closure of the mandible in relation to the upper jaw, yet, to me, its presence is a positive hindrance to the subsequent arrangement of the artificial teeth. The minute my base plates are secured to the casts, and the casts are properly mounted upon some kind of anatomical articulation, then, preserving the lip line, the median line, and possibly the cuspid eminences, I want to get rid of most all of these wax rims. Why? Because I cannot bring myself to the belief that anyone can properly arrange artificial teeth without knowing something about the location and relation of the underlying ridges which are going to support those artificial dentures. When you begin to cut out a little wax here and there and set up the teeth, you must know something about the relation which each tooth is going to bear to the ridge which supports it. Hence the minute I place the casts upon the articulator I want, like Dr. Hall, to get that wax away, and to get my teeth back against the model, or somewhere so I will at least know the relationship which they bear to the model.

There are many more phases of this subject which I would like the opportunity of discussing from a practical point of view, but I do not feel like imposing on you because my friend Dr. Dittmar has indicated to me that he also has something to say. I want to conclude by saying this, that I think the Chicago Dental Society is to be congratulated upon having presented to it at this particular time the methods devised and suggested by the essayist of the evening, and I am going to make this prophecy in closing my remarks, notwithstanding that my friend Dr. Prothero took issue upon a good many phases of the subject, that time will prove that the theories offered by Dr. Hall tonight are sound.

DR. G. W. DITTMAR:

Mr. President, Ladies and Gentlemen: The hour is very late and I have a great deal to say. However, I am not going to say it.

I will try to be brief and to the point, yet I am inclined to tell you this little story; you have heard the old saying that "seeing is believing."

About four years ago, some of you may remember, I was very sick with typhoid fever and after recovering I went to Texas to recuperate, and while at Houston I had the good fortune to meet Dr. Hall. Some way he heard I was there and asked to meet me. He invited me to his office and showed me some things, and really I was converted right then and there, for never up to that time had I seen such artificial dentures. I had spent years and burned midnight oil studying the science of prosthetic construction. I knew about Gysi's great work and understood his method. I knew what Dr. Prothero had given us, but I also knew I had never seen artificial dentures such as these were. Dr. Hall was kind enough to call in a patient simply to show me a practical case in operation which was the most perfect set of artificial dentures I had ever seen, from the standpoint of articulation, occlusion and masticating efficiency. Then he showed me all of the mechanical devices, and they were many and intricate, that he had been working on that finally resulted in the articulator he showed tonight. I have been further converted from time to time since, for I have seen, I think, eight or ten cases of wonderful results: results I did not believe it possible to obtain, that were made according to the method Dr. Hall showed tonight. I simply tell you this because, as I say, I was converted from what I saw. Now, there are many nice things I would like to say about Dr. Hall, about all this work, this excellent paper, its sound scientific deductions, and about all these wonderful inventions; but I have not time. There are a few little points, however, that I want to dwell upon.

The very heart of this proposition is in Dr. Hall's first statement, "A denture can be no better than its foundation." That is a fundamental fact. Dr. Gysi's teachings are that the condyle path, or the angle of the path the condyle travels in, should govern our setting up of the teeth. We should set them up so they will correspond with the angle of the condyle path with the occlusal plane. The theory is that we should set up the teeth so they will correspond with the movements of the condyles in the fossal. When I was down in Texas four years ago Dr. Hall showed me that he paid no particular attention to the details of that theory, and built dentures

where the teeth guided the mandible into its proper relation just as natural teeth do, and that the condyle movements had nothing in particular to do with it. In other words, he did what nature does. Nature builds long cusps and these cusps guide the mandible into position. He showed by illustrations tonight that he builds those cusps long and that these cusps guide the mandible into its proper position. Dr. Prothero says that in a normal case nature builds them so we have anatomical occlusion, so-called. That, in my opinion, happens once in a while, but not very often. The point I want to make is that Dr. Hall has reversed the proposition and makes the teeth guide the mandible in the final act of masticating. The principle of this whole thing in getting a *foundation* for the dentures is in taking of the impression. Whether you take it in modeling compound by the Greene-Supplee method or the plaster method of Dr. Hall does not make any great difference provided you get a proper impression. I want to throw out a point that Dr. Hall failed to mention. If you take your impression in plaster, just as he indicated, yes, or in modeling compound unless corrected as per Supplee, and you do not make allowances for the hard and soft areas in that mouth, you are going to get into trouble. You have to make relief for those hard areas and you have to take into consideration the soft areas and you should be guided by the teachings that Drs. Prothero, Wilson, Turner, Greene, Supplee and others gave us years ago. If there is a hard spot in the mouth, you cannot expect to make a good working denture without making relief for that hard spot.

Now, Dr. Hall made a classification of No. 1 and No. 2, normal and abnormal, and Dr. Goslee spoke of abnormal cases. I cannot recall what Dr. Goslee said, but the point is this, that in that abnormal case where we have the anterior portion soft and flabby, possibly the hard tissue has been badly absorbed because the patient has worn an upper denture with only six or eight anterior teeth below, it would be folly to use modeling compound to take that impression unless the Supplee technic for such cases is followed. If you take it with a modeling compound the old way you are going to fail and the patient is going to have a most uncomfortable plate as a result. The technic I would follow in that would be this: Either use the Supplee technic or after making the tray along the lines Dr. Hall suggested, I would in the anterior portion of the tray

cut out a good deal of the black impression tray so that the soft and flabby portion can hang down in its normal position. Then I would take very soft plaster and gently work it up and get an impression without any material displacement of that soft tissue.

Now, then, another point I want to make regarding the Hall method of taking the impression. After you have made your tray and put in the first coat of plaster and taken the first impression, be sure you lay this first plaster impression into cold water while you are making the second mix of plaster. The second mix of plaster must be decidedly thinner than the first one. That can be repeated a third or fourth time if necessary.

Now, I have a lot of notes, but it is so late that I shall not attempt to speak further. Dr. House is here from Indiana, and he is an expert. Dr. Roach is here and he may have something to say on the subject.

There is just a word I want to say in defense of myself because up to the present time I have been guilty of teaching the older principles, especially with reference to the articulation. When I came back from Texas four years ago and met my students for the first time, I said, "Never was I so confused in presenting this part of the subject of prosthetic dentistry. I do not know what to teach. I saw Dr. Hall's wonderful results that were obtained by an entirely different method from what we had had before, but all I can do is to tell you about them, for we have not the materials and appliances to work with, so I will have to teach the older ideas and technic." That is what I have been doing. I make that kind of an apology every year to my seniors and I will have to make it for a while longer, or until we get the appliances and teeth, and when we do, I will be very happy to teach these newer ideas in the making of plates. Regarding the taking of impressions and making of casts, we have been practicing Dr. Hall's method for the past two years in the college clinic, with most gratifying results.

DR. HOUSE (Indiana):

Dr. Hall and Gentlemen: I did not expect to make a speech on this subject. I came here to learn something, because I was very sure I would have a great opportunity to learn. I do feel that in many ways Dr. Hall has not done himself justice in this matter tonight. I think he had a wonderful paper and I believe there are few men who have not been working with this line of material

who were really able to appreciate the things he was talking about. It is a line of work I have been working with for one and a half years and I would say it is most practical. I have worked at denture making for fifteen years and I cannot help feeling that my successes were accidents and my failures were very scientific. But after getting started with this work Dr. Hall has given us, I found it could be very easily adopted and I can say very conscientiously that it is the most efficient line of plate work I have ever seen. These deep cusps are far from being as efficient with the balanced surface as they are with this other method. I have had opportunity of working with both kinds and I think that in a few years the work Dr. Hall has done and is doing for the profession will be most highly appreciated. I am sure the theories are sound, because they are practical, and practical application is what the dental profession needs. I want to assure you that this theory as Dr. Hall has given it and is teaching it is a Godsend to humanity over anything that has ever been done in plate line. I am sure there is one thing he did not speak about which has been one of the marvels to me in this work, and that is, it is sensible but simple. In this work, followed properly, you have simplicity and accuracy and efficiency, and consequently it is the greatest success I have ever seen in artificial denture.

DR. SEARS (U. S. Army):

A couple of years ago I was present at a discussion of about twenty or thirty dentists on the soft ridge and front cast, and the statement was made there that plaster could never be used for soft ridges and fronts. The reasons were given and practically everyone agreed to it, and tonight Dr. Dittmar said that modeling compound could not be used—

DR. DITTMAR (interrupting):

I said that with plaster by cutting off the long front and leaving a rim for the ridge, and to take this first with soft plaster you would get as good a result.

DR. SEARS (resuming):

The point is just the same either with compound or plaster, provided you get some body to the cast and do it so the soft ridges in front can be handled best. The soft ridges that are as soft as the upper lip can be treated in such a way by either method, provided it is properly molded out.

The whole thing that pleased me about this discussion and some recent discussion was that we seem to be tending toward some standardization of methods. Mr. Supplee had some methods about plaster impression taking. He went down and studied the Greene course and took over a very great deal of the Greene method and published it as the Supplee method. He and Dr. Greene have probably given us more than any other two men on this particular subject. Recently, though Mr. Supplee has been teaching compound impression taking, he has made a classification of four different classes. Class 1, which is also Dr. Hall's, is the normal type, where the impression can be taken in putty or in plaster or in anything, but there are certain types of casts that should be taken in compound. Also, Dr. Hall has recently used compression along the posterior margin of the tray with modeling compound. In every way it seems that the men of authority have been fighting each other, and are gradually adopting each other's ideas and some day we may have a standardization of technic of bite taking, of impression taking, of occluding teeth. Of course, as long as we live, as long as men are advocating these methods, there will be adherents to the Hall method and to the Supplee method, but there will come a time when all these methods will be grouped together and we shall have one practical method, just as today we have the Liberty motor. The various companies manufacturing motors have combined their ideas and we have the Liberty motor. That does not mean there are not to be improvements. The U. S. Army has a standardized truck, in which all the models are fused, but it does not mean that we shall not have various kinds of trucks after the war or that we will never again have various kinds of trucks. It means that these discussions tend to bring about various points and the principle Dr. Hall has brought out will live as long as he will live, and longer. I rejoice in a discussion which brings together the various methods for a better standardization of practice.

DR. W. V. B. AMES:

Mr. President, I have been hanging near the edge, expecting each discussion to be the last. We are certainly going some when we can keep this much of the audience here until this hour.

I just want to comment on the fact that while Dr. Hall's subject was the retention of full dentures, three-fourths of his talk and nine-tenths of the discussion has been on phases of prosthetic

dentistry which are not the prime factors of denture retention. I would like to have this subject come up again and have Dr. Hall come here with some of his pictures, or loan them to me, and let us have a couple of hours on the retention of artificial dentures—a discussion of this valve idea of preventing air from getting beneath the plate and thereby having the plate retained in such a way that there may be an artistic arrangement of teeth, which would be anatomical in the mouth at hand and have a retention of the denture that will enable the patient to have service. I would like to see this subject threshed out again.

DR. F. E. ROACH:

Mr. President, Ladies and Gentlemen: Let us make a night session of this. I started home and I had to come back. It is rather late for me to be out, but personally I feel sufficiently interested in this subject to make a night of it. I believe the subject is deserving of it. I have the utmost and most profound admiration for a man with the courage that has been displayed here tonight. I call it courage, and yet it is more than courage, it is nerve. A man who has the courage to come before such a society with the message that Dr. Hall has brought tonight must have a conviction that is backed up with something tangibly right.

I believe that I am not in a position to discuss this paper, for the reason that what I know about Dr. Hall's system is not much and what I do not know would make a very good size book, so as far as my personal experience is concerned I have nothing to say. I have nevertheless seen considerable of Dr. Hall's work. I have already gone on record with the statement that to my mind it is revolutionary. It seems to me that it can be no other than revolutionary. The very fact that Dr. Hall diametrically opposed practically everything that we have had taught us or practiced for the last half century, and the fact that he is not only telling us how these things can be done and what you can do with them, but he has actually done them, is proof of the correctness of his principle. The proof of the pudding is in the eating, and while I have not been, as I have said, an experienced eater, I have been sitting at the table by men who have been eating this pudding, and it is a mighty good pudding. I have studied these principles and I have made a careful examination of the cases that I have seen in the mouth. I have seen some few artificial dentures and I have seen some con-

siderable artificial dentures made by many of the best men in this and in foreign countries, and never yet has it been my privilege to see such dentures as Dr. Hall has shown. Is it any wonder that he has the courage to come out and diametrically oppose everything that we have known and tried to practice? I am free to admit, as Dr. Goslee has said, that I have been disappointed time and time again with the method we have been practicing in anatomic occlusion. I have not been able personally to satisfy myself that it was possible to carry out the measurements of these various movements of the jaw and register that condyle path and carry that registration to the teeth and to set up those teeth to correspond with these movements and feel that the results would be in accordance with what was supposed to be the anatomic articulation. If you study the relation of the condyle to the glenoid fossa you will find a wide range of mobility, and for that reason it is quite impossible to determine and register a definite path through which it travels. Dr. Hall's plan of having the teeth guide the jaws to place seems entirely logical and from what I have seen I am convinced that he is right. I believe in it, gentlemen. I believe in this revolutionary step. I believe it is an epoch-making position in prosthetic dentistry. It seems to me it can be nothing else than epoch-making. Now, personally I want to lend my strong endorsement to what Dr. Hall is doing. As I told him, I am going to start in now and study this subject, take a post-graduate course, if you please, and try to learn to make artificial dentures such as he is making. His method of impression taking, his arrangement of teeth seem to me to be so radical that I have to pinch myself to see if I am not dreaming. Really, it is too much for one evening. I think we should devote not one evening, as was suggested, but many evenings to the study of this subject.

DR. W. D. N. MOORE:

Mr. President, Ladies and Gentlemen: I hardly think it is right to keep you here longer, especially as nearly all the speakers who preceded me have taken the wind entirely out of my sails, particularly Dr. Roach. I cannot attempt to discuss this whole subject, but I want to say that I do admire the courage of this man Hall. I have the greatest admiration for a man who will dare to come into a meeting like this and diametrically oppose all present theories and prove by his work that he is right. Dr. Roach said

that the eating of the pudding was the proof of it, and it is really applicable here. I have tried the impression method that Dr. Hall has demonstrated here tonight and I never before had such results and such satisfaction as I have had with his method of taking impressions. I will have to admit that I never could definitely trace the condyle path, but I thought it was my inability. I do not believe the center of movement of the mandible could be located with any degree of accuracy, because the size of the fossa will admit of a wide range of movement, and in addition the soft tissues make it more difficult of location. I did not like to take this exception before, but I see now it was also the belief of others as well as my own.

Dr. Hall's technique in taking these impressions is most worthy of our admiration. His detail is most commendable. On account of time he has not told us all, and as Dr. Roach said, let us adjourn tonight and have another session tomorrow. He is full of his subject and I would like to have him talk more about his methods. He has not done himself justice and he has not given the men here all his ideas. He has something, as the other men have told you, that is going to work out practically and will revolutionize plate work. This audience and its attention till this late hour must be most encouraging for the hard work and thought Dr. Hall has given this subject.

DR. RUPERT E. HALL (closing):

Mr. President, Ladies and Gentlemen: Owing to the late hour, I shall be as brief as possible in my closing remarks. I have the greatest admiration for Dr. Prothero. I was a student under him. I would not say or do anything that would reflect upon his expert judgment, but I do insist that the mandible, normally, is not in a state of rest when the teeth are in occlusion. In observing the Doctor's mandible while he stood before us and talked in his discussion just now, it was clearly evident to me and others, that while pausing, between words and sentences, his muscles were relaxed and his mouth was more or less open and his teeth were not in occlusion. The orthodontist tells us if the teeth were in occlusion when the mandible and muscles are in the state of rest, they would not be able to regulate mal-positioned teeth without first opening the occlusion and holding the teeth apart. Such does not happen to be the case and the Doctor is mistaken beyond all doubt. However,

should he have such a condition in his individual case, it may and would be justly classed an abnormality, as most certainly the condition is not normal and in my opinion a rule in accordance with the condition for practice based upon acceptance of a condition peculiar to the Doctor's individual case or others. so characterized, is not, as laid down in the Doctor's text book, justifiable or acceptable.

Dr. Prothero said the theories of retention as presented were not new. No claim was made that they were new. The paper credited Doctors Greene and Ames with having first conceived and demonstrated its principles. Quoting from the records we find the following: "In 1901 Dr. W. V-B. Ames demonstrated the utilization of atmospheric pressure in the retention of entire dentures by so constructing them that the entire periphery extends upon and slightly displaces lax tissue." The essayist's paper was an attempted treatise on the philosophy of the forces that retain full dentures, with, perhaps, added light upon the fundamental principles underlying the phenomena of denture retention, the methods and technic of denture adaptation being a minor or secondary consideration. If we understand the underlying principles of retention it does not matter by what technical procedure we secure the result.

In reply to Dr. Prothero's criticism that I did not explain the theory, construction and use of my articulator, I desire to state that it bore no direct connection to the subject of my paper proper. The philosophy of full denture retention and its fundamentals is the subject before us for discussion. It matters not what appliances or technic we employ, so we achieve the desired result. However, inasmuch as the Doctor has seen fit to bring up and condemn the principles of my articulator, in which he makes the statement that it is all wrong, that the temporo-mandibular articulation will not permit the condyle, in movements of mastication, to move upward and backward on the working side as represented by my articulator; and that the center of lateral masticatory movement of the mandible is not about a center in the medial plane, I have only to say in reply to this that the Doctor does not understand the principles, construction and workings of my articulator. Please, Doctor, do not think I am opposing you personally. but you do not understand my articulator in the slightest degree or you would make no such statements as you have just made. You have never even had an explanation of it. Therefore you could not understand its principles or pass

upon its merits.

DR. PROTHERO (interrupting):

I sat through two of your clinics and heard two of your lectures.

DR. HALL:

I beg your pardon, Doctor, you were at the closing part of an impression clinic and at one articulator clinic, and then for a period of only about thirty minutes, and you did most of the talking. If you will permit, it will be a personal pleasure to take you through the work any time, and I am certain you will be surprised at what I have to show you. Your statements would lead one to believe that you do not understand that the center of the opening and closing movement on my articulator is on the occlusal plane below the condyles; that the incisive center is still below the opening, and that in consequence, in movements of mastication, the condyles advance and descend about the opening and incisive centers, modifying or off-setting backward and upward movements of the condyle on the working side occurring about the central or mandibular axis. The movements of the working condyle, then, are not wholly backward and upward, as you think, at all. Furthermore, you cannot disprove my claim and demonstrations that the lateral masticatory movements of the mandible emanate in the median (region of the vertebral axis) and are concentric. I have some good things in mandibular movements I should like to show you any time you care to see them.

With reference to the Gysi articulator which you so substantially approve, we quote the following: Gysi, *Dental Cosmos*, 1910, states, according to certain records, that, "during the forward and downward movements of the one condyle, the other condyle runs more or less backward horizontally." When the supposed or so-called rotation points (metal pins) on the Gysi articulator are set interiorly to the condyles and the balancing condyle registers downward movement, the condyle on the working side registers a backward and upward movement. You condemn my articulator for this character of movement, stating that the temporo-mandibular articulation will not permit such movement, yet you commend the movements of the Gysi appliance.

In reply to your criticism of my grinding the teeth so many times, and assigning the cause or necessity for so doing to what you

believe to be faulty movements of the articulator, I wish to state that I said nothing whatsoever about grinding the teeth many times. I described grinding the teeth to perfect occlusion and articulation, but said nothing about repeating the process. Grinding the teeth is a necessary step in all cases, and is accomplished by applying carborundum to the teeth in the Automatic Anatomic Articulator. And if the teeth occlude and articulate in the mouth the same as in the articulator, either after one or more grindings, it proves the correctness of the movements of the articulator.

As to the rectangular spaces for food displayed upon the screen, formed by the teeth in masticatory movements, to which you took exception, I insist they are true to nature. This has been amply demonstrated and is substantiated by others experienced in the application of the principles laid down by me and worked out in my articulator. I have never inserted a set of dentures that the patient did not instantly, in masticatory movements of the mandible, establish such relations between the teeth, the rectangular food spaces always being present. Doctors Wilson, Dittmar, Campbell, House, Patterson, Owen and all others following these principles will vouch for their soundness.

The Doctor further states in connection with his criticism of the rectangular spaces that the buccal marginal ridges are arranged in nature, and should be so arranged in artificial teeth, that the food in the process of mastication should all be thrown to the lingual, that it does not and should not escape to the buccal. Indeed, I do not know what he means; his statement seems queer. The food is mainly held in the buccal cavity and thrown back and forth between the teeth until insalivation and mastication have prepared it for deglutition, when it is gradually or en masse passed to the lingual and on to the stomach. It is obvious that a bolus of food mashed or crushed between the teeth would be thrown both lingually and buccally. I know of no arrangement or condition in nature that forces all of the food to the lingual, nor do I conceive of such being possible or desirable in artificial teeth.

With reference to the registration and recording of the condyle paths which Dr. Prothero states he considers the most important step in the arrangement of the teeth, I will relate an incident that disproved the importance of this theory. I constructed for the experts of the S. S. White Dental Manufacturing Company to dis-

prove this condyle path theory and to prove the logic of my articulator, three sets of dentures for the same individual, with varying arbitrary condyle paths. One set with paths of 24 degrees, one with 32 degrees and the other paths of 45 degrees—all with teeth of corresponding guiding cusp angles. Without regard to masticating efficiency, all worked perfectly, either set working as well as the other. The real truth of the matter is, that the extent of the movements of the condyles in masticatory movements proper are so infinitesimal that their true course and extent of movement is inconsequential. Therefore, let us desist from further study and attempts at recording their movements. There is nothing to the theory, as interpreted, and still less to the practice. The teeth guide the masticatory movements of the mandible and not the condyles.

Dr. Goslee's discussion, and those of the other gentlemen following, were all favorable to the principles and work laid down in the paper and illustrated upon the screen. They appreciate the fact that seeing is believing and that the proof of the pudding is in the eating. They have seen it demonstrated and have seen it work and know it to be a mighty good pudding. If I had not proved both to my friends and to myself the practicability of its principles, I most certainly would not have consented to appear before you to-night. Its principles are sound and the results are satisfactory, and it is the result that we are after.

Dr. Dittmar's remarks in favor of the paper were, as he informed you, based upon a personal acquaintance and experience with the theories and work as promulgated and practiced by your essayist for the past few years. The accuracy of the results has convinced him of the soundness of the theory.

Dr. Moore, in his discussion, suggested that I describe the consistency of the plaster and the technic of inserting the tray. Cast plaster* (not impression) is mixed very thin, using hot water and potassium sulphate and the spatulation as required to hasten crystallization. The tray carrying the thin plaster is inserted and vibrated to place. This causes the plaster to flow about the flexible tissues. The tray is vibrated in place of having the patient make muscular movements, as in the correctible compound method. Only

*Cast plaster for use in this method was first advocated by Dr. M. M. House, of Indianapolis, Ind.

light pressure is employed to carry the tray to place and the patient is instructed to slowly close the mouth to the position of repose as placement of the tray progresses. It is not necessary to hold the tray in place while the plaster crystallizes.

I enjoyed Dr. Ames' discussion very much. I especially requested Dr. Ames to be with us and discuss the subject this evening. I want to take exception to his statement, however, that 9/10 of the paper and illustrations dealt with other things than its subject, "The Retention of Full Dentures." Every phase of the paper is related to denture retention. Faulty form and arrangement of the teeth will cause dislodgement of the dentures. They may interfere or through inefficient cutting and grinding edges and planes require greater pressure or force for the perfect incision and mastication of food than the mechanical and physical retention of the bases will counteract. The entire paper and illustrations were aimed and it is believed do relate directly to the subject. It is feared that adaptation of the base to the jaw has been too much looked upon as the lone factor governing the retention of artificial dentures. Whereas the facts are, this is but one factor in the retention of artificial dentures.

The hour is late, and I have said all I have to say at this time. I appreciate the kind manner in which you have listened to my paper, and have enjoyed your discussions. And I trust we have all been benefited. Thank you.

NORTHERN ILLINOIS DENTAL SOCIETY, OCTOBER, 1917.

DISCUSSION OF PAPER READ BY DR. EARLE H. THOMAS ON "INDUSTRIAL DENTISTRY AND WELFARE WORK IN ILLINOIS."

DR. A. B. CULHANE, Rockford, Ill.:

Mr. Chairman and Members of the Northern Illinois Dental Society: The paper which we have just had the pleasure of hearing is an unusually interesting one, and I wish to compliment the essayist as well as thank him for this contribution to our programme. I did not see the paper until yesterday and so I am unprepared to properly discuss it.

It is interesting to know that large corporations are co-operating with their employees in the manner described by the essayist.

The welfare work, the medical and dental supervision, the many forms of recreation, all have a tendency to bring to the mind of the employee contentment and happiness that were denied him in the past.

You will find no I. W. W.'s in any of the industries mentioned by the essayist. I believe there is at the present time an over-capitalization of public welfare work. That may not be true with industrial welfare work, however.

The policies of the industrial dental infirmaries seem to differ as to the scope of the work, Montgomery Ward being the only firm mentioned by the essayist where all the work necessary is done by their dentists. The function of the dentist in the other firms seems to be advisory and instructive, employees being advised to consult their own dentists. This plan seems to me the better way.

Now, just a word regarding the man who has his work completed, say at Montgomery Ward; he pays the bill, comes home and compares what he paid with the bill rendered his wife by her dentist, and finds a large discrepancy. Now, possibly they reason the thing out, probably not, and is there not danger of that wife going to the advertiser in an effort to have her work done at about the same cost as the husband?

Again I wish to thank the essayist for his splendid paper.



THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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THE NEXT MEETING OF THE NATIONAL DENTAL ASSOCIATION.

As has already been announced the 1918 meeting of the National Dental Association will meet in Chicago the first week in August. This city is prepared to extend a most hearty welcome to every eligible dentist on that occasion. The President, Major W. H. G. Logan, is a resident of Chicago, though at present—as every one knows—he is at Washington most of the time looking after the welfare of the profession. He is outlining plans for the greatest dental meeting ever held, and has already gathered around him a band of loyal helpers in the way of committeemen, who will see his wishes carried out.

Another fortunate circumstance is the fact that the secretary's office has been moved to Chicago, though the *Journal of the National Dental Association* will be issued from Huntington, Ind., as formerly. This gives us the opportunity of extending to the efficient Secretary, Dr. Otto A. King, a cordial welcome to Chicago, with the expressed hope that he may find his work in this city most congenial and satisfactory.

Everything seems particularly propitious at this time for a record-breaking meeting. New York set a noteworthy pace at the meeting of the Association in October last, and in order to exceed in interest that great event it will be necessary for every member to begin work now and work incessantly till the time of the meeting. The five months intervening between now and the first of August are none too long in which to prepare for this meeting. On account of the difference in dates it will be only ten months from the 1917

meeting to the 1918 meeting, and we must make the most of our time.

An exceptional feature of the 1918 meeting will be the unveiling of the G. V. Black monument, the contract for which has been let. Those in attendance will have the privilege of seeing this splendid work of art, and this of itself will be well worth a trip to Chicago by all of those who knew and loved Dr. Black.

The committee having in charge the clinical program is already hard at work, with the prospects of one of the best clinics ever held.

By August the splendid work now being done by the Preparedness League of American Dentists will make literature which will be well worth reading. In fact we confidently expect that the record of the service done for the drafted men before going to camp, under direction of the League, in conjunction with the Surgeon General's office, will prove the most meritorious piece of work which the profession has ever undertaken. The slogan is "1,000,000 free operations for the men of the next draft." If this is accomplished it will be something of which the profession may well be proud, and we look for an announcement of this character at the next National meeting.

With the present activities of the profession in a scientific, military, and philanthropic way, the coming meeting should outstrip in interest any meeting the Association has ever held, and this is the theory upon which those in charge of the meeting are at present working.

Chicago will be host, and Chicago sends out to the profession everywhere a most cordial invitation to come here in August and join hands to make this meeting a memorable event in dentistry.



THE EDITOR'S DESK.

THE SHAME OF SOME OF OUR PEOPLE.

We are at war. The announcement is made at this time because of the fact that some of our citizens seem to have overlooked the matter entirely. At least their actions would make it appear that they ignored the fact of war, or in any event that they had no individual responsibility in the war. While the majority of the people are earnestly devoted to the patriotic duty of supporting the Government in every way possible, living up to the regulations imposed by the necessities of the war, and depriving themselves willingly of many of the comforts and luxuries of former days; there are those who are determined not to deprive themselves of any thing if they can help it, but who arrogate to themselves the privilege of getting the greatest possible comfort out of life irrespective of the consequences to others. If a meatless day is declared, they ignore it. If a wheatless day is deemed necessary by the food administrator they smirk at the regulation and eat wheat bread. They flout in the face of the Government's request to conserve the food supply of the country. They waste at will just because they have the dirty dollar to buy more. They have as little respect for the rights of others as so many hogs crowding in a trough.

When the war was still young I went into the dining car of a railroad train and saw a polite request on the menu card which read something like this: "During war time it is necessary to conserve the food most carefully. Everything you order on this car which is not used is wasted." It was a reasonable, patriotic, and perfectly proper intimation to the patrons of the road to be careful about ordering food they did not need, and it should have been accepted in the spirit in which it was meant, and above all it should have been rigidly observed. But was it? The people who sat opposite me at table ordered as lavishly and as foolishly as the average patron of a dining car usually does. They were surrounded by generous portions of all kinds of food—enough to feed twice as many hungry soldier boys—and of course, they did not eat half of it. They merely pecked at this dish and pawed over that, and even then they ate more than was good for them. They wasted more than they used and they used more than they should. The man wore a big fob on his watch chain, and sucked his teeth. He swaggered out of the dining car as if he owned the earth, and wanted everybody to know

it. What did he care for the rights of others? What did it matter to him that boys were fighting knee deep in the trenches, cold and probably very hungry? He was feeding his own precious gullet, and the rest of the world, soldier boys and all might go *to*.

And a woman, riding on a western train, when the first wheatless days were proclaimed, raved furiously when she ordered white bread and the waiter called her attention courteously to the fact that it was wheatless day. She stamped her tempestuous foot and sent for the conductor. He tried to reason with her, but there was no reason in the woman. Finally to save a further scene they sent for bread and served it to the little hussy. If I had been conductor of that car I would have lost my job sooner than to have served that woman bread under the circumstances, and I like women too—mostly.

It is just such men as I have referred to, and such women that constitute the greatest shame of our country today. To them war with all of its cruel sacrifices means nothing compared with the gratification of their own selfish senses. They aim to set themselves apart from the great moving and breathing mass of humanity, assuming all the while that they are not, and should not, be amenable to the same regulations that govern ordinary mortals. The truth is that every individual should be amenable to Government regulations, and the sooner our citizens recognize this fact the better it will be for the country.

Reasonable or unreasonable, judicious or injudicious, necessary or unnecessary, the recent fuel regulation was one of the best things that has been done since the war broke out. It served notice on the people that this country was at war, and that in the prosecution of that war it was necessary for the Government to make demands on the people that were not operative during ordinary times. And while there was some grumbling—as there always is—it can be said to the glory of this nation that the people generally accepted the mandate and obeyed it in the proper spirit.

Some day the food situation may be as acute as was the fuel situation unless our citizens respect the intimation sent out by the Government regarding the conservation of food, but before that day shall come I want to see men and women such as I have described brought down to hard tack and molasses for provender, and the pick and shovel and wash tub for occupation. It will be better for them in every way—morally and physically—than so much selfishness, meanness, and gluttony.

BOOK REVIEWS.

AMERICAN ILLUSTRATED MEDICAL DICTIONARY (*Dorland*). A new and complete Dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Science, Nursing, Biology, and kindred branches; with new and elaborate tables. Ninth Edition Revised and Enlarged. Edited by W. A. Newman Dorland, M.D. Large octavo of 1,179 pages with 331 illustrations, 119 in colors. Containing over 2,000 new terms. Philadelphia and London: W. B. Saunders Company, 1917. Flexible Leather, \$5.00 net; thumb index, \$5.50 net.

This work has already secured an established place in professional literature, and the present edition will add materially to its reputation. In the last two years many new medical terms have been introduced through the medium of the war; and dentistry has also introduced quite a number. As a result more than 2,000 new words have been added to the present volume, making an addition of about 40 pages.

In completeness and compactness it would seem as if the present volume left very little to be desired in a work of this kind.

SURGERY AND DISEASES OF THE MOUTH AND JAWS. By *Vilray Popin Blair, A. M., M. D., F. A. C. S.*, Professor of Oral Surgery in the Washington University Dental School, and Associate in Surgery in the Washington University Medical School, Third Edition, revised, with 460 illustrations. 733 pages. Published by C. V. Mosby Co., St. Louis, Mo.

This well-known work has been brought down to date by incorporating the latest war data concerning gunshot injuries of the face and jaws. It has been adopted by the army and is used in teaching in the schools of oral and plastic surgery conducted by the Government in different cities throughout the country. If this were not sufficient endorsement of the work, the reader will only need to turn to its pages to be convinced of its great value in its special field. Of particular interest at this time will be found the chapters on "Fractures of the Jaws," a subject which is taken up in all of its phases, and with painstaking detail. We commend the work most highly.

PRACTICAL HINTS DEPARTMENT.

This department is for readers who are busy. Articles, to be available must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Easy Method of Removing Regulating Bands:—To remove regulating bands or crowns, grasp the band with forceps and squeeze with firm pressure, repeating the process around the tooth if possible. This will loosen the cement and may even expand the band so that it can be easily removed.—*F. W. Stephan, Chicago.*

Handy Cloths:—Keep on hand a good supply of clean cloths two or three inches square. One important use is in connection with treatments: Before rolling cotton on a broach take a square, moisten with alcohol, take between thumb and finger of left hand and rub vigorously. Of course, there are numerous uses for these cloths.—*J. T. Search, Onarga, Ill.*

Protecting Cement Around Inlays:—Unless the cement used for setting inlays is a hydraulic cement, it should be protected from moisture for some time after the inlay is placed. A good method of doing this is to flow wax over the joint between inlay and enamel with a heated instrument. Leave the wax on till it is worn off by friction of the tooth brush or by mastication.—*I. C.*

To Test for a Living Pulp:—For a cheap and highly efficient electrical pulp tester, try the following: Generate a static current by sliding the feet (while walking) over a small rug placed near the chair. For anterior teeth, lightly touch them with the tip of the forefinger; for posteriors, use a canal plugger or an explorer. Keep one foot sliding while applying the test.—*R. W. Lee, Chicago, Ill.*

Keeping Matrix Bands:—A convenient way to keep your Matrix bands after you receive them from the dental dealer, is to remove them from the original package, sterilize and put them in a bottle of oil of eucalyptol, thymol and menthol, then cut a groove

in the sides of a cork, and drain off surplus, and they will be sterile and ready for instant use. Replace a solid cork when through draining. Having them in a bottle you can see what you want.—*Y. E. Whitmore, Little Rock, Ark.*

Anneal a Lingual Bar:—In the construction of lingual bar cases for partial lower dentures where the bar is to be soldered to gold saddles, the bar should be thoroughly annealed after bending and final adjustment has been completed, otherwise the heating in soldering will cause the bar to spring, and the case will not go back to place properly on the cast, and failure will result in the mouth. This result will also obtain in vulcanite cases unless bar is annealed before final adjustment.—*Victor H. Fuqua, Chicago, Ill.*

Efficiency:—In the fertile field of dentistry there is a wonderful opportunity for roots of the plant called "Efficiency" to develop. Have a plan to work by, i. e., First, do it right; second, with as little pain as possible; third, as quickly as possible; fourth, try to do the present operation a bit better than the last one. One night add, stop talking to your patient but keep your mind on your work, stop puttering and fumbling around, looking for this or that instrument, plan three or four moves ahead and your patient will quickly realize your efficiency.—*W. O. Fellman, Oak Park, Ill.*

Bleaching Teeth:—One of the very best bleaching agents for discolored teeth is 25% pyrozone. The root should be filled, and a pellet of cotton saturated with the pyrozone should be placed in the cavity and sealed with cement. It may be left two or three days, and if a tooth can be bleached at all it will be bleached by this method. The pyrozone comes in sealed glass tubes. Care must be exercised in opening the tube. It should be chilled on ice and wrapped with a towel, letting the narrow end of the tube extend from the towel. This can then be snipped off with pliers, and the contents of the tube poured into a clean glass-stoppered bottle. A second application of the pyrozone may be necessary in deeply discolored teeth.—*Ed.*

Cement and Gutta-percha Fillings:—We have heard a lot said about cavity preparation and we can not hear too much, judg-

ing from what we see daily—"Cavity preparations for gold inlays," "Cavity preparation for porcelain inlays," "Cavity preparation for Amalgam fillings." But—not enough is said about cavity preparation for Gutta-percha and especially for cement fillings. If a cavity for a cement filling is properly prepared and the cement given lots of time to "harden," a cement filling is a wonderful filling. "What is the *right* or *best* way?" Why ask? *You* know. Simply *take your time*, trim off the very frail edges, smooth off the margins. Alcohol and dry it, then oil of cloves and dry it, and you will be saving teeth. And that's your job. Gutta-percha fillings will be most effective if the cavity has solid flat walls and right angle edges—and—cleared with alcohol and oil of cloves and thoroughly dried. Cement must have lots of time to set.—*Homer Almm.*

MEMORANDA.

ONTARIO DENTAL SOCIETY.

The Fifty-first Annual Meeting of the Ontario Dental Society will be held in Toronto, Canada, April 29th to May 2nd. J. P. MacLachlan, D.D.S., 26 College Street, Secretary, Committee.

MISSOURI STATE DENTAL ASSOCIATION.

The Fifty-third Annual Meeting of the Missouri State Dental Association will be held at Columbia, Missouri, April 1, 2, 3. A splendid program is in preparation, and great things may be expected. J. F. Wallace, Secretary, Canton, Missouri.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL ALUMNI ASSOCIATION.

Homecoming Clinic June 10th and 11th, 31 West Lake Street, Chicago. Special features have been provided which will insure a successful and interesting meeting. Make your arrangements now to be in attendance. For information address Dr. M. M. Printz, Secretary, 4235 Lake Park Avenue, Chicago, Ill.

IOWA STATE DENTAL SOCIETY.

The fifty-sixth annual meeting of the Iowa State Dental Society will be held in Des Moines, Iowa, May 7, 8, 9, 1918. An excellent program has been prepared, including seminars, papers and clinics. A cordial invitation is extended ethical members of the profession from out of state, to attend any or all of these sessions. E. R. Swank, Secretary, Panora, Iowa.

PENNSYLVANIA STATE DENTAL SOCIETY.

The Golden Anniversary Meeting of the Pennsylvania State Dental Society will be held in Wilkes Barre, April 23rd, 24th, 25th and 26th, 1918. Excellent talent has been secured for the occasion and the program extended

to a four days' session. To judge by preliminary reports of committees, this event promises to be the greatest meeting in the history of this organization. All ethical practitioners are cordially invited to attend. J. F. Biddle, Secretary, 517 Arch St., Pittsburgh, Pa.

NATIONAL DENTAL ASSOCIATION.

As was announced in the December (1917) *Journal of the National Dental Association*, the 1918 meeting of the National Dental Association will be held in Chicago the first week in August. The House of Delegates and the Board of Trustees will meet Monday, August 5th, and the meeting proper will begin Tuesday morning and close Friday noon.

During the holidays Major Logan was in Chicago and completed arrangements for holding the entire meeting—all sessions, clinics, exhibits et al, at the Auditorium and Congress hotels, Michigan avenue and Congress street. These hotels are connected by a large underground tunnel running under Congress street. The commodious quarters of these hotels, located and connected as they are, afford just such a meeting place as Major Logan would have made "to order" had he planned this space himself. Those who are intimately acquainted with the president know what this means.

The various committees have now been appointed, and with the section officers, are steadily at work to the end that no detail will be overlooked which would in any way add to the success of this meeting. That the meeting may be truly representative of the National, the general clinic committee has directed a letter to the presidents of the various state societies, asking for at least two clinicians. So far as is practicable the same idea will be carried out in the program for the various sections. Among the important features will be the unveiling of the monument to the late Dr. G. V. Black. The sketch has been drawn and accepted and every practicing dentist owes it to himself and to his profession to be present on this memorable occasion. Hotel reservations should be made at once. J. P. Buckley, Chairman Publicity Committee.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

NOTES AND NEWS OF IMPORTANCE.

The treasurer, Dr. L. M. Waugh, reports a most satisfactory response to the circular letter recently sent out as a means of recruiting members. A careful tabulation has shown that prior to January 1, 1918, there were, in round numbers, 5,700 members of the League. Up to February 1st, in response to the circular letter above mentioned, 4,900 new members have been enrolled, and Dr. Waugh reports that applications for membership have come in so rapidly, about a hundred a day, that as yet it has been impossible to classify by states. This will be reported next month.

By a recently made rule, the buttons are to be sent to new members without extra charge. (Old members can get the button for 25c.) Therefore, members will please do two things: Get your button; wear your button. You are asked to wear it, not to advertise yourself, nor the League, but we want to make the man without a button conspicuous.

In France, within thirty days after the beginning of the war, all persons serving the government; soldiers, hostlers, drivers, railroad men, and labor of all kinds, skilled or unskilled, wore arm bands reading "Military Service." Men without bands became very conspicuous, and received scant consideration from the "Women of France." Wear your league button.

All dentists who have not yet filled out Form 3A are requested to do so at once and mail the same to Lieut. Heckard.

DENTAL ANESTHETISTS WANTED.

My Dear Dr. Ash—I am just in receipt of one of your circulars of the Preparedness League of American Dentists, and would sign up and return

cards only I am a physician and surgeon, and I am furthermore disabled with arthritis from actively participating in your efforts.

However, despite my disability and the limitations of a wheel-chair, I am co-operating with the surgeon general and Council of National Defense in recruiting expert anesthetists for immediate service at the front in the base hospitals and casualty clearing stations.

In this recruiting we have not drawn any lines between the surgical and dental anesthetist, believing that both are fully competent for this service. The Interstate Association of Anesthetists, of which I am secretary, has welded the interests of the medical and dental professions so thoroughly that recently in Ohio our attorney-general, in an opinion, delegated equal privileges to medical and dental anesthetists. We are anxious to have the verdict of the war hospitals indorse this amalgamation.

It has been with some difficulty that we have persuaded the surgeon general that anesthetists, surgical and dental, are in great demand at the front. To emphasize their value Captain Gwathmey, of the Lakeside Unit, while loaned to the British army, during the attack on the Messines Ridge, kept three surgeons busy and standing at the head of three tables, radiating like spokes of a wheel, put thirty-four wounded soldiers under anesthesia during a period of five and one-half hours. Truly a record, and showing what the expert anesthetist can do in limiting the horrors of war.

The German, French and even the English anesthetic service collapsed promptly at the outset of the war, and thousands of wounded were operated on without anesthesia, agents and administrators both being lacking. We are trying to avoid such a collapse of our surgical and dental service.

In this connection, if in your canvass you encounter any dental anesthetists who desire active service, or who will accept anesthetic service at base hospitals at home, or are competent to act as instructors, or in replacing those in hospitals who have lost staff anesthetist to active service, let me have their names and addresses and I will try and see that they are given their chance of doing their bit.

Appreciating the efforts you are making and wishing you every success, I remain, cordially yours, F. H. McMechan, Avon Lake, Ohio.

DENTISTS ON MEDICAL ADVISORY BOARDS.

The government has established a new and improved system of dealing with men who claim exemption because of alleged physical defects. What are known as "medical advisory boards" have been formed, to which a man may appeal from the decision of a local exemption board, or to which the local board may refer doubtful cases. These boards, for convenience, are located mainly in conjunction with hospitals, and include high grade and skilled medical specialists.

Dentists have likewise been appointed to all of these boards. This is a recognition by the government undoubtedly due to the services which have been rendered by the Preparedness League.

The majority of the dentists appointed on the medical advisory boards are already members of the League. However, state directors are requested to obtain the list of such appointments, and if they find thereon anyone who is not a member of the League, a personal letter will probably induce such man to join with us.

EXEMPTIONS FOR DENTAL DEFECTS.

From early indications the dental members of the medical advisory board will have ample work to do. These boards not only examine cases of appeal, but also those cases where the local board examiners are in any doubt as to the physical disability of the registrant. The men are then classified as: "For general military service," "For limited military service," or exempt.

There has been a disposition on the part of the local boards to shift the responsibility for the dental cases, which will be partly overcome by the presence of dentists on these boards, otherwise the present number of dentists on the advisory boards will be inadequate.

The selective service regulations admit of the broadest construction, and if taken literally, indicate that no man need be exempted because of defective or missing teeth.

SECTION 185, DENTAL REQUIREMENTS.

The person must have at least eight serviceable natural masticating teeth, either bicuspid or molars, four above and four below opposing, and six serviceable natural incisors or canines, three above and three below opposing. These teeth must be so opposed as to serve the purposes of incision and mastication. There must be one molar above and one below on one side which occlude; the remaining six opposing masticating teeth may be either bicuspid or molars.

Teeth restored by crown or fixed bridge work, when such work is well placed and thoroughly serviceable, are to be considered as serviceable natural teeth within the meaning of the above paragraph.

A well-fitting artificial denture, plate, or removable bridge is allowed to take the place of missing teeth, providing the serviceable natural teeth on one side of the mouth are sufficient to meet one-half the masticating (bicuspid or molar) requirements fixed above as the minimum.

If dental work will restore the teeth so as to meet the requirements outlined in the preceding paragraphs, the man should be accepted and sent to his cantonment, where the dental work needed to bring him within the requirements will be carried out.

DIFFICULTY OF INTERPRETATION.

Observe that in one place the regulation says that well fitting artificial teeth may take the place of natural teeth, provided that the natural teeth on one side of the mouth could sustain half the requirements of mastication. This is a little difficult to construe, especially as artificial teeth attached on one side alone constitute a more difficult problem in construction, than where attachment may be made on both sides.

The last paragraph of the regulation provides that if artificial teeth would bring the man within the requirements of the original standard the man may be accepted and sent to his cantonment and the work will be done there.

Already the medical members of the advisory boards are construing this to mean that if artificial teeth can be made for a man, he may be accepted. If this be the meaning, then dental examination becomes useless because artificial teeth can be made for practically any man.

A closer study of the requirement, however, would seem to mean that only one-half of a man's masticating apparatus may be restored by artificial teeth. But if this is meant, the wording of the rule is unfortunate, since it seems to require that the restoration may only occur when the deficiency is on one side, which describes the least useful type of denture.

However, this is not the place to discuss this matter. It is mentioned here merely that the League may give the question intelligent study.

LOCAL EXEMPTION BOARDS.

The government will probably appoint at least one dentist on every local exemption board in the country. If league members would serve on these boards, it would greatly facilitate the league's work, as in most cases the conscripted man could be directed at once as to where he could have his dental defects treated. Therefore directors of states are urged to scrutin-

ize all appointments to local exemption boards, and to enroll all non-members within our ranks as rapidly as possible. It is desirable to appeal to the adjutant general of your state and urge him to secure nomination for these boards through the presidents and officers of local boards.

R. Ottolengui, Publicity Committee

CAMP PIKE DENTAL SOCIETY.

On January 8, 1918, the dental surgeons of Camp Pike organized a society, naming it "Camp Pike Dental Society." Colonel John H. Hess, D. C., the division dental surgeon, was elected honorary president; First Lieut. Edgar T. Blocher, D. R. C., president; First Lieut. Henry W. Rich, D. R. C., vice-president; First Lieut. George H. Elliott, D. R. C., secretary-treasurer.

The object of the society is to increase the efficiency of the dental corps, bringing the members closer together, to broaden their knowledge along certain specific lines mainly that of oral and war surgery. The meetings are held Tuesday evenings of each week. George H. Elliott, Secretary-Treasurer.

OBITUARY.

DR. E. B. DAVID.

Dr. Elijah B. David of Aledo, Illinois, was born in Ontario County, New York, June 8, 1835, and died January 3, 1918, of blood poison, at the ripe age of nearly 83 years. His parents moved to Grass Lake, Michigan, when he was three years of age. Here he grew to manhood and received his education at Albion College. He studied in the office of Dr. Dean, a well-known dentist of Albion. His health failed and he came west in 1858, and settled on a farm in Richland Grove Township, in Mercer County.

He enlisted August 16th, 1861, as sergeant in Company A, 30th Illinois Volunteer Infantry, and was commissioned second lieutenant February 15th, 1862, and for meritorious conduct at Fort Donaldson he was made first lieutenant April 22, 1862. On September 3, 1862, he was made captain of his company and served in this capacity until his honorable discharge from the service on October 27, 1864, at Chattanooga, Tennessee. Members of his company testified to his good care of his men, to his brave leadership and his concern for their every interest. On his return from the war he lived in New Windsor until he moved to Aledo in 1873, and opened an office for the practice of his profession. Here he continued in active practice for 34 years, retiring in 1907.

He became a member of the Illinois State Dental Society in 1873 at Rock Island, Illinois, and continued active in his membership, holding the offices of vice-president, librarian, executive council, and various committees.

He was united in marriage on September 1, 1862, to Elizabeth Woodhams. Mrs. David passed away November 25, 1905. Dr. David left four children, Mae D. Hebbord, of Lincoln, Nebraska; Otto A. David, of Pittsburgh, Pennsylvania; Cora D. Pyles, of Coulee City, Washington, and Dr. G. L. David, of Aledo, Illinois.

Dr. David was a life member of the Illinois State Dental Society, a member of the Military Order of the Loyal Legion of the U. S. A., and a comrade of the G. A. R. of Aledo.

He early affiliated with the Baptist church, and did splendid service in promoting the interests of the Aledo church.

Dr. David, though a professional man, was interested in so many lines of usefulness that it is impossible to say in what he was most influential. He served his community for many years in various capacities as officer in Mercer County and was always faithful to whatever trust was imposed upon

him in these places of responsibility. His encouragement of everything for the advancement of agriculture opened up perhaps the widest field for his usefulness. He was secretary of the Mercer County Fair for ten years. As a member of the State Board of Agriculture for thirty years he did an inestimable amount of good work in the several departments of the State Fair. He was auditor of that board for twelve years. He was a delegate from this board to the National Live Stock Association convention and was made secretary of the same.

He was chairman of the committee which inaugurated old soldiers' day at the Illinois State Fair. He represented the Fourteenth Congressional District as a commissioner of the World's Columbian Exposition at Chicago, in 1893, and was chairman of the Horticultural Committee which made the exhibit of those products of Illinois at the great show in Chicago that year. He was also one of the auditors of the Illinois Commission of the World's Columbian Exposition.

Dr. David's interest in agriculture was of practical value to his own locality and to the whole state as well. Before there was a law passed creating the Farmers' Institute, he at his own expense, organized and conducted farmers' institutes in every county in the Fourteenth Congressional District.

He never spared himself in his efforts to further the interests of good farming and stock raising and to bettering the conditions in agricultural life, and his untiring work has to some extent been appreciated by his fellow citizens and friends through the state and the country, by his having been honored with so many positions of trust and responsibility.

Dr. David rounded out a long and useful life with honor and fidelity. He was ill only about ten days and the end came peacefully.

Services were held at the residence of Dr. George L. David, Sunday, January 6th, at 1:30 p. m., by Rev. A. E. Moody, and the burial was in Hopewell Cemetery.

DR. JOHN ROSS CALLAHAN.

Born in Ross County, Ohio, in June, 1852, son of Dr. Denis Callahan, physician and dentist, Hillsboro, Ohio, graduated Philadelphia College of Dental Surgery 1877. Began practice in San Francisco, California, in 1877. Returned to Hillsboro in 1879, in practice there until 1890. Located in Cincinnati in 1890, succeeding to Dr. C. R. Taft's practice. Active in national, state and local societies. Secretary for several years and president 1891 (Ohio State Dental Society). President of Cincinnati Dental Society, 1906 and 1907. Pioneer in research work. Received Jarvie Medal Rochester, N. Y., May, 1917. Head of dental department Cincinnati General Hospital. Director of Research, Cincinnati Research Club. Member of Cincinnati Research Society. Honorary member of many state and local societies. Ardent life member Delta Sigma Delta fraternity. Married in 1880, family surviving wife, two daughters and one son. Death occurred during Tuesday night, February 12th at Queen City Club, of apoplexy. Funeral services chapel of the Cincinnati Crematory at 4 p. m. Friday, February 15th.

PALL-BEARERS.

Elliot H. Pendleton, Dr. T. Irving Way, Prof. B. W. Foley, Dr. Frank A. Hunter, Dr. A. B. Thrasher, Dr. E. E. Hall, Dr. William H. Taggart, Dr. Henry E. Germann.

HONORARY PALL-BEARERS REPRESENTING THE VARIOUS SOCIETIES.

National Dental Research, Dr. Weston A. Price; National Dental Association, Dr. L. E. Custer; Ohio State Dental Society, Dr. Z. N. Wright; Indiana State Society, Dr. Carl D. Lucas; Cincinnati Dental Society, Dr. Walter P. Stewart; Cincinnati Academy of Medicine, Dr. J. H. Landis; Cin-

cinnati General Hospital, Dr. A. C. Backmeyer; University of Cincinnati, Dr. C. W. Dabney; Cincinnati Dental Research Club, Dr. C. Stanley Smith; Cincinnati Delta Sigma Delta Fraternity, Dr. C. P. Sweny; Miami Valley Dental Socieity, Dr. A. J. Lewis; Columbus Dental Society, Dr. W. I. Jones.
T. Irving Way.

The following editorial in the *Cincinnati Times-Star* of February 15th, 1918, well expresses the appreciation in which Dr. Callahan was held by the laity:

"JOHN R. CALLAHAN.

"The death of Dr. John R. Callahan is a great loss to dental science. Dr. Callahan's professional activities took him far beyond the routine of his practice. He labored for the general advancement of his profession and had no small share in widening the scope of dentistry until it became one of the important factors in general diagnostics. From his laboratory came many contributions to dental science, the harvest of experimentation as unselfish as valuable. The scientific imagination was one of Dr. Callahan's attributes, the ability to see beyond the immediate causes into the causes of causes; to trace symptoms to their source instead of being satisfied with superficial manifestations.

"There is something heroic about a professional career that so quietly contributes to the general good of humanity. There is no perfervid appeal to 'the peepul' to recognize service in their behalf. The emoluments are in no sense commensurate with the achievements. The effort finds its reward largely in the effort itself and in its scientific fruition. Any praise from the outside world comes largely from the few possessed of the special knowledge that equips them for appreciation.

"Such for Dr. Callahan's career—the unselfish labor of a scientist in humanity's behalf. He worked hard, accomplished much, and received his mead of praise from those familiar with his achievements. The greatest tragedy of his death lies in the things that he would still have accomplished and which he was forced to relinquish to other heads and hands."

The editor of the DENTAL REVIEW wishes to express his personal sorrow at the death of Dr. Callahan. Lack of time before publication prevents an adequate tribute to the friend who has gone, but the editor feels that he must at least place on record his great appreciation of Dr. Callahan's service to the profession, of his loyalty to his friends, and of his constant devotion to duty. No man had a more secure hold on the affections of the profession, and no man will be more truly mourned. The only ray of satisfaction is the fact that before his death Dr. Callahan was made to realize that his life-work and his personality were appreciated by his friends. This is our comfort at this time.

DR. REUBEN NEAL LAWRENCE.

Another veteran of the Illinois State Dental Society has passed over. He was a man loved and honored by all the members of that Society who knew him; greatly beloved by the membership of the Episcopal Church in Lincoln, whom he served faithfully many years as senior warden and lay reader, always officiating whenever, for any reason, the clergyman was absent; and respected and honored by the entire population of the town.

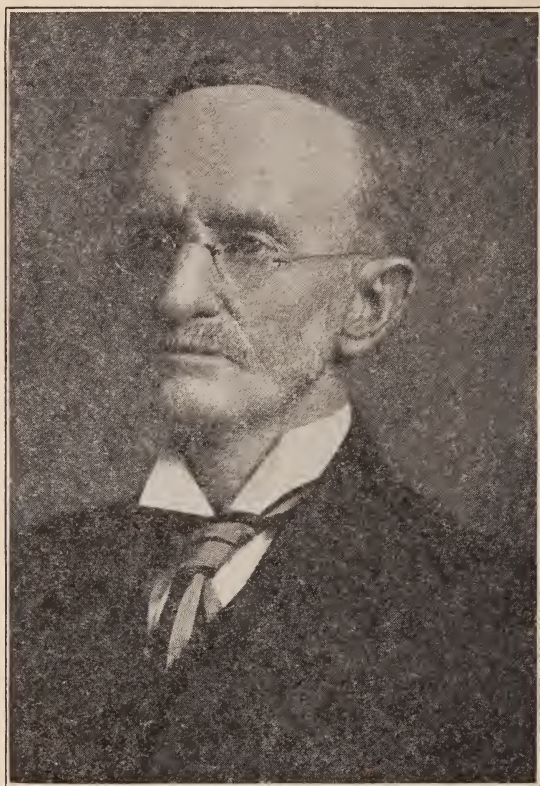
Doctor Lawrence died January eighth, of pneumonia, after an illness of only a few days, and he was in the active practice of his profession until the beginning of his fated illness. He was past seventy-eight years of age, having been born July 13, 1839, in Logan County, Illinois.

He was a very successful practitioner of dentistry, being especially skillful with pyorrhea cases, and for this treatment many came to him from far distant places.

He joined the State Society in 1879 and was therefore a life member for the past fourteen years. He was president in 1900.

Doctor Lawrance was a classmate of the writer in the Ohio College of Dental Surgery in the winter of 1866-7 and having been a student or practitioner for four years, received his degree of D. D. S. after only one term in college. He practiced in Atlanta, Illinois, and Holly Springs, Miss., and came to Lincoln in 1878.

He was a veteran of the Civil War, having enlisted as a private in 1861



Dr. Reuben Neal Lawrance.

and being mustered out in March, 1866, with the rank of First Lieutenant after a service of four years and eight months.

Doctor Lawrance was married in Cincinnati in June, 1868, to Miss Mary Cool. She died in December, 1915. There are two children living: Dr. Edward P. Lawrance, practicing dentistry in Lincoln, and Mrs. Geo. H. Karcher of Chicago. He served with distinction in the Masonic Order and at the time of his death was Grand Prelate of the Grand Lodge of the State of Illinois. The following is copied from a Lincoln paper:

A TRIBUTE.

The following was tendered the deceased by a co-worker in Trinity Church:

"Doctor Lawrance is dead." Such was the message that went forth from

St. Clara's Hospital yesterday afternoon about five o'clock and many were the tears shed by men, women and little children, who knew and loved him and upon whose ears and hearts the sad news fell with unwonted sorrow. Good, gentle, kindly Doctor Lawrance, the man in whom there was no guile; the exemplary Christian gentleman; the devoted soldier patriot; the upright citizen; the gracious parent; the essence of honor and chivalry; the friend of every one in the community, has gone to his rest but is not dead for in the hearts and memory of all who knew him, and the circle of his friends was as wide as the great state of Illinois, he lives and his works follow him.

Not dead, but gone before, leaving the record of an honorable life well lived, a legacy more valuable than all the dross of earthly gold, a treasure above price to his children and all who were associated with him in business or social life; a monument more enduring than cold marble though it should be carved by the most masterly hand.

The State, the City of Lincoln, the Church, has suffered a great loss in his passing but Paradise has gained from earth a prize of inestimable value. We bless God and give Him thanks for the good example and sweetness and faith and purity and love of this saint and pray Him to give us grace "to follow in his train."

EDMUND NOYES.



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THE DENTAL REVIEW.

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CHICAGO, APRIL, 1918

No. 3

ATTACHMENTS TO VITAL TEETH.*

BY EDWARD T. TINKER, D. D. S., MINNEAPOLIS, MINN.

Mr. President and Members of the Chicago Dental Society: I do not know whether you gentlemen realize as I do the honor which you bestow by inviting me to appear before you. We men on the outside have looked to Chicago as the hub of dentistry, and I can truthfully say that of all the good things that have come to our profession in the last few years, Chicago has contributed most of them. I do not need to enumerate. You have the men and you know who they are.

What I have to show tonight I do not consider very new. In fact I have given this talk so frequently over Minnesota, the Dakotas, Iowa and cities west of here, that it seems more or less of an old story. However, never having given it before a Chicago audience, I feel that I can show something that possibly may be of interest to you.

The idea I have to present emanated from your city. The late Dr. Wassall twelve or fourteen years ago presented a paper at Washington in which he described the gold shoulder crown. These crowns were all placed upon devitalized teeth, using a bur-nished matrix and building the contour after the inlay technic of that day. At that time I was doing considerable work along the line of restoration in mouths affected with pyorrhea. The banded crown had always been a source of trouble and never quite filled the requirements, principally from the fact that where used, further prophylaxis was practically prohibited.

When Dr. Wassall stated that with his method he could produce margins whereby the continuity was preserved between the root and crown surface, it appealed to me, and consequently

*Read before the Chicago Dental Society January 26, 1918.

I adopted the method. At that time we did not recognize to the fullest, the relations between mouth foci and systemic conditions. However, we did recognize the relation between pyorrhea and systemic disturbances long before the realization of infected apical areas attained their full significance.

It remained for later years with the use of the X-ray to show the conditions that existed in those areas above the roots, so that it has come to a point now where devitalization of the pulp of a tooth, done simply because the pulp is in the road, is a thing that is discountenanced by most of us, and any method which will preserve the tooth or teeth in their natural state, as far as the pulps are concerned, is the one we should accept.

When Dr. Taggart gave us his invention, I found that it was possible and entirely feasible to apply it to bridge abutments which could be used almost indiscriminately on vital teeth.

I shall not attempt to cover the entire field of crown and bridgework as it is a subject so large as to make it impossible to cover any one phase of it in one evening. I use removable bridgework. I also use inlays as bridge abutments. However, this evening I will devote entirely to a few slides illustrating full and partial crowns, their application and methods of construction as applied to vital teeth.

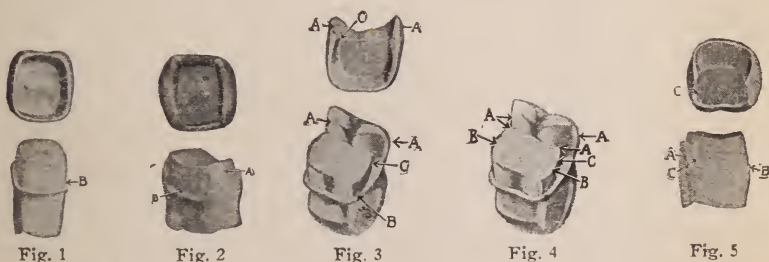
We will take up for consideration the full crown, meaning the crown which extends beneath the gingiva to every point. I show it first because it is the least used of any attachment, being indicated in very short teeth only. Teeth where they are generally indicated include lower third molars, upper third molars, occasionally lower and upper second molars, and lower bicuspid where the lingual cusp is so short as to practically give no frictional wall to resist the force of mastication.

The usual objection to the application of a full gold crown on vital teeth does not obtain when we apply them as they are indicated, from the fact that we do not encounter bell shaped crowns in these instances. Forms of crowns for those types of teeth will be shown subsequently.

The technic for tooth preparation will apply largely in a modified form to all the subsequent preparations. The one point which I wish to drive home and make you clearly understand is that the word shoulder as applied to them is clearly a misnomer,

and is only used for want of a better term. If you can grasp the idea and fix it firmly, that this shoulder is the very last part of your preparation to be heeded, you will have grasped practically the proper preparation for the gold jacket crown.

The technic I will state briefly. First with a vulco-carbon disc cut both mesial and distal contact points away, making at the same time a shoulder just beneath the gingiva the thickness of the stone used. Now with a smaller stone of the same type you are enabled to dress back both mesio-and disto-buccal and lingual angles. With a cylinder-shaped stone remove buccal and lingual enamel to the point from where you wish your crown to draw. Then with a very small stone of the same type, definitely outline



the shoulder which in many instances amounts to nothing more than a line simply deep enough to allow a flush joint with the periphery of the root. As to the occlusal surfaces, they should never be ground flat except in teeth where from natural attrition the cusps are entirely worn away, for in all cases after you have ground the occlusal, its general shape should conform to the tooth before preparation was started. In other words, a millimeter to a millimeter and a half gives us sufficient thickness for the gold in the majority of cases. This thickness should obtain in the fissures, transverse grooves and pits as well as on the tips of the cusps. You have everything to gain and nothing to lose by following in detail the foregoing thoughts. You will gain sometimes as much as half of the length of all frictional walls from the gingiva to the incisal edge. Obviously you will add protection to the horns of the pulp, which is a very important consideration.

Type used where we have bell shaped crown, but necessary as in the case of pitted enamel or any other reason which makes

protection of the cusps imperative. Treat mesial and distal surfaces same as in the full, crown, extending the buccal and lingual margins only so far gingivally as to encounter sound enamel and complete the circle of the tooth.

The most common type of attachment used on an upper molar tooth, namely a three-quarter crown. This utilizes every surface excepting buccal, which you generally find in a healthy state on these teeth, making the sight of gold no more conspicuous than an ordinary mesio-occlusal inlay.

Merely one of technic to impress the fact that the shortest distance mesially should be from A to A, and the longest from B to B to guard against lingual displacement. In order to always attain this desired feature remove just as little enamel from the mesio- and disto-lingual angles as is possible and make these walls parallel, allowing the crown to draw from the gingiva. Just as much as we, by careless procedure, remove in excess to that which is necessary, just that much closer must we bring our axial walls at A to the pulp. This rule not only applies in a molar three-quarters crown but in any three-quarter, which I shall subsequently show.

A typical attachment for a lower first or second molar, especially a second where the first has been removed and the second moved forward and to the lingual, creating a difficult situation. The lower molar is the only tooth where the buccal surface is the surface used in addition to the mesial and distal with the construction of the three-quarter crown. In many cases, were we to attempt cutting back the lingual cusps to a point allowing the removal of the full crown, we would endanger the pulp and be very apt to have future trouble. In these cases we only extend the lingual margin far enough gingivally to complete the encircling of that tooth. All other margins in the great majority of these teeth treated must extend beneath the gingiva.

Fig. 6.—Typical bicuspid.

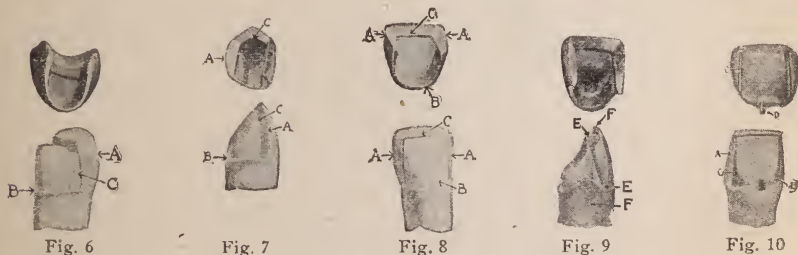
Fig. 7.—Typical cuspid.

Fig. 8.—Typical central. Lingual aspect.

Fig. 9.

Fig. 9 is illustrative of the proper position for the grooves on the mesial and distal surfaces. When we recognize that these are the all-important points of retention for any type of a three-

quarter crown, we must recognize that their proper position must be fully as important. A very natural mistake is to place them parallel with the long axis of the tooth. However, this is entirely wrong, for, on account of the gum septum, it is the shortest distance from the cutting edge to the gingival margin. The proper position for this groove is from A to A paralleling the labial plates and terminating the groove in the extreme mesio- and disto-labial angles, automatically making our preparation self-cleansing, and giving us practically one-third longer retention. By so doing



we also come as near completing the circle around the lingual to the same point on the opposite side of the tooth as is possible and still retain the labial plate of enamel undisturbed. They also automatically parallel your abutment with any posterior abutment of the same bridge, as in a normal set of teeth, the central incisor tips labially to the incisal surface, the lateral a little less, cuspids still less, and bicuspsids practically perpendicular.

Fig. 10 illustrates the only position where we deem pin retention necessary and advisable in crown attachments. We have certain types of teeth with which to contend where we have no pronounced singulum. On the contrary, the lingual contour from the gingiva to incisal is one convexity. In these cases we would have to depend entirely on the two grooves for retention. We are able to utilize a 20-gauge iridio-platinum threaded pin in the lingual pit, giving us what practically amounts to three dowels.

THE PAST, PRESENT AND FUTURE OF PLASTIC SURGERY ABOUT THE HEAD AND NECK.*

BY JOSEPH C. BECK, M. D., CHICAGO, ILLINOIS.

Mr. President and Members of the Odontological Society of Chicago: It is with great pleasure that I come before you with a subject that is so timely, and in which I know you are all much interested. I trust you will pardon me if I do not read a paper, because I feel that in such a small circle as yours it will be of more practical benefit if I present the subject *ex cathedra* and ask you to interrupt me as frequently as you desire, so that I may be able to give you what you want.

I would ask that you do not hold me to a strict accountability for dates, because I did not look them up especially for this occasion, and will have to rely on my memory.

RHINO-PLASTY.

I should like to start with the work of the great Tagliocozzi, whose illustrations I herewith present, and you will note that some of the methods and apparatus that he employed back in the fifteenth century are still in use, although very much modified. The Italian method of plastic surgery, which is also known as the Tagliocotian method, was one of the first recognized types of reconstructive operation. It means to borrow tissues from other parts of the body, such as the finger, forearm, or arm, by permitting them to become fast attached at the defect, while at the same time remaining attached to their source until union has taken place at the defect. After that, the required tissues are severed from their source and adapted to resemble the deficient part. This requires the immobilization of the parts, both the source and defect. Tagliocozzi recognized the one difficulty, namely, the marked inconvenience to the patient during this immobilization, consequently he developed a jacket, which was later supplanted by the plaster of Paris cast.

This jacket was made of leather re-enforced with metal strips

* An extemporaneous talk, with presentations of photographs, before the Odontological Society of Chicago.

which would be made to fit the head and neck and fix the patient in any position desired.

ASPARIS
TALIACOTII
BONONIENSIS,
PHILOSOPHI ET MEDICI PRAECLARISSIMI

Theoricam ordinariam, & Anatomem in Gymnasio Bononiensi publicè professentis.

De Curtorum Chirurgia per insitionem,
LIBRI DVO.

In quibus ea omnia, quæ ad hucus Chirurgie, Narium scilicet, Aurium, ac Libiorum per insitionem restaurandorum cum Theorice, tum Practice pertinere videbantur, clarissimæ methodo cunctatissimè declarantur.

Additis Cutis Traducis instrumentorum omnium, atque deligationum Iconibus, & Tabulis

Cum Indice quadruplici expeditissimo, Capitum singulorum, Auctorum, Controuersiarum, Rerum denique & verborum memorabilium.



VENETIIS, MDXCVII.

Apud Robertum Meietum.

Illustrations from Tagliacozzi's work.

The patient's arm would be put to the face, the jacket put on, and the parts immobilized the same as with a plaster of Paris cast. He gave the patient a chance to become accustomed to the restrained position, which is one of the most essential factors in the Italian method, namely, to get the patient accustomed to the position before he is permanently fixed in a jacket or plaster of Paris cast. This Italian plastic surgeon also made a metal cast of a nose that looked like the nose that this particular patient ought to have, as a sort of model. For instance, here (illustrating), is the prognathous face, the ears sticking out. Tagliacozzi would set about to construct a nose to correspond to that kind of face. In speaking of the history of plastic surgery the name of this man will stand out as one of the pioneers and best surgeons of plastic surgery.

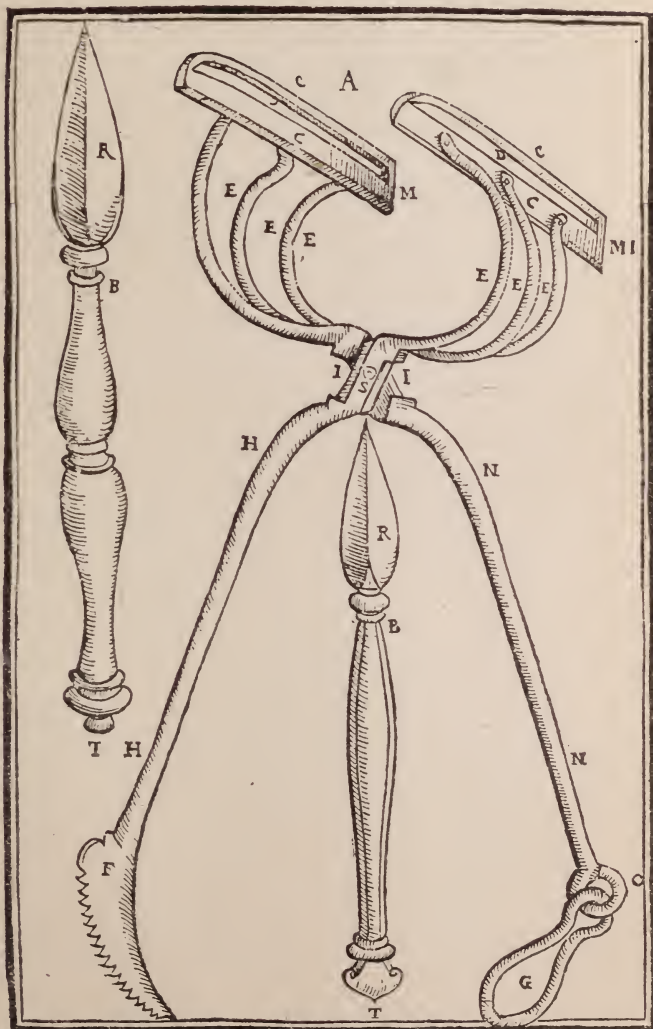
The work of transplanting from arm to forearm and finger to the face, to the nose, and also the transplanting of skin flaps from hand to abdomen to face, date back as far as the fifteenth century.

We then come to the seventeenth century. In this century Dieffenbach describes a new operation, showing how a nose may be constructed from different parts of the body. In this period there was a better surgical technique developed and a rediscovery of plastics in Dieffenbach's time. Between the Italian period and German period of plastic surgery there was a lack of reports. An Englishman by the name of Symes, who was interested in plastic surgery, gives a description regarding the rebuilding of noses and meloplastics, which is fairly well illustrated in the literature of that time. Then came the Hindu or Indian method of reconstructing noses. According to history, Indian women frequently had reconstructed noses as punishment. It is said that when the husband, after being away for some time, would return and find that his wife had been unfaithful to him, he would hack off her nose. It was very common for men to destroy the noses of their wives, it being considered one of the worst forms of punishment they could inflict upon them. Hindoo surgeons developed the Indian operation for the formation of a nose from the forehead in pedicle form. This was a great step forward in regional plastic surgery, but real rhinoplasty began in the eighteenth century, at which time the German method of performing operations on the nose by the formation of flaps from

the face was developed. Langenbeck was one of the earliest workers in this field. He began by making flaps from the cheeks,

CHIRVR. CVRT.

Icon Secunda.



in mind the function of the lids to avoid exposure of the cornea. from the labial region and from the lid region, always bearing

In Langenbeck's work you will find in his discussion of making sliding flaps that he continually laid stress on ectropion, the complication of turning the eyelids out, thus trying to cure one ill and producing one worse by forgetting the lids, the tear ducts, and cornea.

Taking the early history of these three periods of operations, we have the Italian method, the Indian, and the German methods as they are spoken of, so far as rhinoplasty is concerned. Rhinoplasty is one of the earliest plastic operations recorded in medical literature. From my perusal of the literature of the present time on plastics on the nose, I should say that Nicholas Senn deserves first place. Senn did excellent work in plastic surgery of the nose. Von Eiselsberg, the great Viennese surgeon, was very busy at the same time that Nicholas Senn was in doing plastic surgery. In Senn's time I was born in medicine, so to speak, and that was about 1895. It was the time when Senn quit active rhinoplasty. His real work in that field of surgery was done before that time. About this time something seemed to have happened to general surgeons all over the world. They quit doing as much plastic work about the nose, and right then there started up a large number of would-be surgeons, actual fakers, with titles of doctors, who pretended to do plastic surgery. You will find no less than 20 books or articles on plastics by men who had absolutely no knowledge or skill to substantiate their positions as surgeons to begin with, especially to do plastic surgical work. They were pretenders in this line of work. That condition was caused, I believe, by the tremendous surgical attainments in operating upon other parts of the body. The general surgeons became busy at this time in doing gastroenterostomies, colostomies, in operating on the liver, and so on, so that he neglected plastic surgery, and the faker got hold of these cases and operated on them many times with disastrous results so far as the individuals were concerned.

The use of paraffin in rhinoplasty began with Gersuny, of Vienna, a capable surgeon of remarkable surgical attainments. He evolved the idea that paraffin was a substance that could be sterilized and would act as a framework for the building of new tissue, and it would serve many purposes. For instance, he stated that we could close rectovesical fistulae with paraffin. In his experimental work he took a mass of vaseline and added par-

affin and raised a flat nose. From that time on the aforesaid pretenders I have spoken of, undertook to repair noses and other

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parts of the body by the use of paraffin. There was absolutely no possibility of their getting satisfactory results in some of the

cases. Following their operations necrosis, sloughing, emboli, hyperesthesia and deformity would frequently result in consequence of such bad treatment.

About this time Max Joseph, of Berlin, brought out his work on plastic surgery of the nose by the intranasal method, avoiding scar formation about the face. In his article he failed to recognize the successful intranasal plastic work of a surgeon in this country, namely, Dr. John Roe, of Rochester, New York, who developed a great fancy for this work. Roe practiced a method of building up and correcting nasal deformities through the nostril without external scar. We might say that Roe and Max Joseph came out with this new work on plastic reconstruction of the nose about the same time.

Dr. Carl Beck, of Chicago, was probably one of the first surgeons in this country to stimulate other men as to how plastic surgery about the face should be done. He showed surgeons his cases before and after operation and the results obtained. It can be said in criticism of Max Joseph and Dr. Roe that surgeons were not able to see anything in the way of operations when they visited their clinics; but Dr. Carl Beck spent a great deal of time in discussing the principles of plastic surgery, and as a result of his efforts many excellent plastic surgeons were developed, and among them the famous Dr. Carrel of the Rockefeller Institute. To Dr. Carl Beck, therefore, belongs the credit, so far as I know, in this country, of teaching how plastic surgery should be done. He is entitled to much credit for pointing out details which are absolutely essential in connection with plastic operations.

Having spoken of the history of rhinoplasty or plastic surgery of the nose, I am going to leave the history of plastics of the palate and jaws to Dr. Brophy for discussion, because he knows more about it and is better able to discuss it than I am.

OTO-PLASTY.

Plastics of the ears or otoplasty is a very important subject for the future plastic surgeon. Up to about 20 years ago otoplasty in this country was unknown so far as any definite report of it was concerned. Then came John B. Roberts, of Philadelphia, one of the foremost plastic surgeons, and whose name should also be mentioned in the history of plastic surgery of the nose. We call him the modern plastic surgeon. Roberts constructed an ear for a child, and the case was reported as one of the first successful cases; but

in the history of ear plastics it is shown that Simonowski, a Russian Pole, about 40 years before that, performed a similar operation.

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I shall be able to show you by means of illustrations and photographs the principles of making an ear from back of the mastoid

region in the formation of a flap. Most of the patients in former days were supplied with artificial ears when they were minus their own. It is so easy to make an artificial ear which can be well retained in the external auditory canal, and it looks so much better than a reconstructed ear that people preferred to have artificial ears. The same thing may be said as to appearance so far as the nose is concerned. An artificial nose is certainly a great deal better looking than one any plastic surgeon can make. But present day plastic surgery of the ear is of more interest since Haaker published his work on plastic operations by means of flaps led through tunnels under the skin. That constitutes a very great advance. He has already reported on his work in the *Journal of Surgery, Gynecology and Obstetrics*. He makes a flap from the region of the neck and brings it up to the region of the ear by first undermining the skin, then brings that flap under the skin, a sort of a tunnel, allows it to reunite under this skin tunnel temporarily, and then he brings it out here (indicating) at the edge, and there he allows it to heal on. When it has healed on at the margins of the side of the head where the new ear will be formed, he cuts the original pedicle and makes use of the attached edge as the pedicle to carry the other end up here (indicating), in other words, a double pedicle. That is a tremendous advance in otoplastic surgery, because it does not require any immobilization like the Italian operation, and it leaves a small scar from the region from which the skin was borrowed; consequently ears may be made from the middle of the back and brought up into the region of the ear without losing the circulation, that is, by this method of migrating flaps.

I have the pleasure of showing you here illustrations of a case that I operated on by such a method of reconstruction with good results.

Dr. Carl Beck has now a case under his care which is also shown here, of a boy who had practically no ears. These ears he has constructed by an original method and will publish later. I supplied him with cartilage to stiffen these ears. That brings me to the present day thoughts about the use of cartilage as transplants in reconstructed ears as well as noses.

If you recall, Professor Quain, in his surgical anatomy and surgical pathology, gave rise to a discussion that cartilage always becomes absorbed when it is once loosened of its perichondrium; it must die, and his experiments seemed to prove it.

Dr. Lexer, another great plastic surgeon, said the same thing, and after Quain and Lexer said this, then the whole medical pro-

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fession said amen to that, that is, they took the position that if Quain and Lexer said it was so it must be so; consequently the profession

did not use cartilage as transplanting material.

In the development of the operations on the nose for breathing purposes, the operation known as submucous resection, I made the experiment of removing the septal cartilage and placing it back again between the mucco-perichondrium in order to see what became of it. In this case, a few years after the operation, the patient died, I believe, of pneumonia, and I was fortunate enough to obtain post mortem a section of the septum in which I had placed this cartilage. I made a microscopic examination of it and found the cartilage had all disappeared. Therefore, I added another point to the facts already established by the two observers, namely, that cartilage would become absorbed when once separated from its perichondrium.

The late Dr. John B. Murphy doubted the statement that when cartilage was loosened from its perichondrium it would die. He found that readhesion of the cartilage took place after operation about the knee joint and after dysarthrosis of the hip joint. While he did not transplant any cartilage to prove this point, he did disprove the fact that when cartilage became loosened from its perichondrium it would have to die. It did not die in his case, consequently he scored a point against the accepted doctrine.

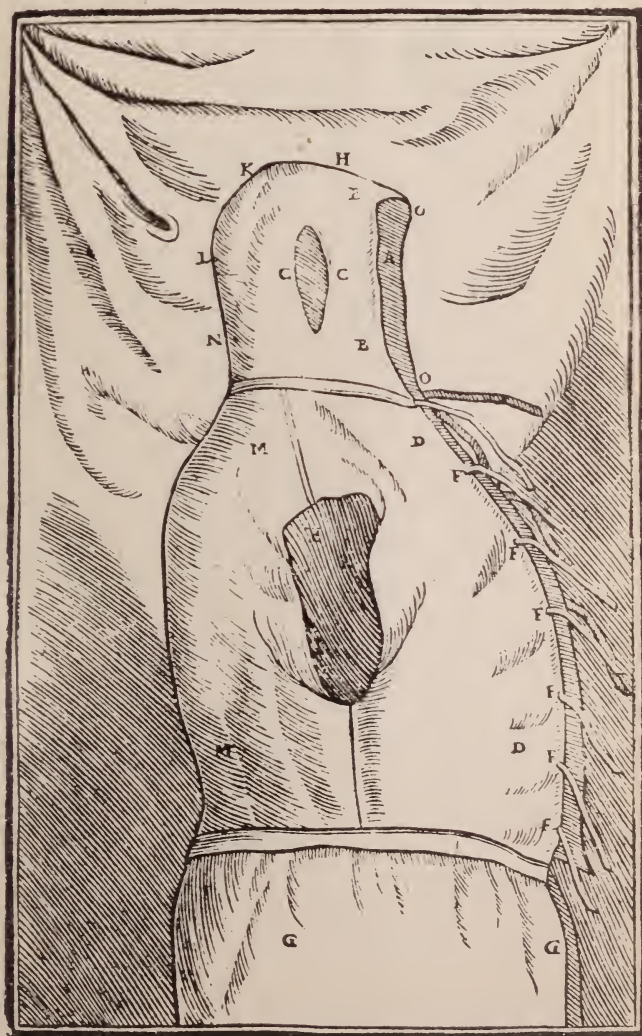
Dr. Beckman, of Rochester, Minnesota, who unfortunately died before he went very far in this work, also disproved it in the following case. Dr. Beckman had as a patient Dr. F., of Montana, whose nose was mashed in by the windshield in an automobile accident. Dr. Beckman took a section from Dr. F.'s costal cartilage and put it into his nose and corrected his deformity. He not only corrected the deformity, but somewhat overcorrected it; so that in two years' time the patient's implant was twice as large as when Dr. Beckman put the cartilage in. Dr. F. came to me and showed me some pictures of his normal nose before he was hurt. He now had a very large nose. Murphy came out early in his work on bone transplantation with the statement that if you wished to transplant bone you must not only denude it of its periosteum, but put it in contact with periosteum where it would remain as such and grow very little; but if you allow periosteum to remain attached it will grow from this periosteum as well as endosteum and overcorrect. When I took out this excess of cartilage from Dr. F.'s nose and subjected it to microscopic examination, I not only found that it was cartilage, but it was active in its growth. The cartilage cells were in a state of hyperactivity. What does all that mean for future

plastic surgery? It means that we can utilize costal cartilage particularly for planting into areas that require correction and stiffen-

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ing. It will survive oftentimes in the presence of mild infection.

I have proven that recently in a number of cases in which I have transplanted cartilage for the building up of noses as well as the stiffening up of ears. There is a point we have at present in dispute—Dr. Carl Beck and I—that is, the transplantation of septal cartilage, for that is what he is using in stiffening ears. He is using septa that I have removed in operating on patients for nasal obstruction. It is about three months since he put this cartilage in, in one case, and it is still hard and stiff like cartilage. Whether it will remain so is a question. I have my doubts about it, based upon the fact that cartilage of the nose is of a different structure, it is elastic, whereas cartilage taken from a rib is mostly chondral cellular tissue of different form. If we use anything at all in the way of cartilage in transplantation work, it should be cartilage as from the costal region.

I have spent a great deal of time in talking to you of the transplantation of cartilage because it is going to be one of the greatest helpful propositions in the future of plastic surgery of the ear, larynx, nose and trachea in the coming conflict, when we will have to repair these structures of our wounded soldiers.

NEURO-PLASTY.

There is a type of plastic operation known as neuroplasty that has interested me greatly, and with which I have some experience. It is the correction of facial paralysis, a deformity of no small proportions. The increase of facial paralysis cases began at the time when modern otologists were developing the radical mastoid operations. It is during the removal of the posterior wall of the external auditory canal that the nerve is usually injured. We find again that John B. Murphy, if not the first, was one of the first to perform a plastic operation for the restoration of function of the facial nerve. He anastomosed the distal part of the facial nerve with the central part of the spinal accessory nerve. Soon after, another method was proposed by Koerte, who employed the hypoglossal nerve instead of the spinal accessory. After that, Grant suggested in addition to the technique recommended by Murphy, the employment of the descendence noni of the hypoglossal to be anastomosed with the distal part of the spinal accessory, thus avoiding in a measure the partial paralysis of the arm, when the latter nerve was employed. These various operations have been performed with a fair degree of suc-

cess. I have had thirteen cases in the past fifteen years with complete recovery in four, and partial recovery in three. The remainder of the cases were from the start not very suitable ones, the patients having been paralyzed for a number of years. Thus, after a successful operation there was a failure because the muscles had already become atrophied.

During the present war there are and will be many cases of facial paralysis from gun shot wounds that will give an opportunity for this plastic procedure. If one should see a case right after injury and feels that recovery without operation is not likely to follow, then immediate enastomosis will give better results than waiting, owing to scar formation and atrophy of muscles.

The success of the future of plastic surgery depends upon three things: immediate repair, the use of transplants, and the subsequent or final corrections. Some of our wounded soldiers are going to come back from this war with badly injured noses and ears that will not be good to look at; nevertheless they will return to this country to have these organs properly reconstructed, because the surgeons at the front will not have the time nor the opportunity to undertake these beautifying operations. But the difference between former plastic operations at the base hospitals and the present plan is this: formerly it meant to clean up the area and wait until it was healthy, and then do the repair work. Now it means to cut out or remove all diseased tissue, to conserve all the tissues possible, bring them in apposition and reconstruct as much as possible. The best way to do this is by an immediate operation, leaving cosmetics to be done afterwards. It is planned not to allow sloughing, contraction, retraction or destruction of vessels in the injured region, for after these things have once happened, not only are the parts cicatrized, but the blood vessels supplying these parts are damaged by the cicatricial contraction. That is what major surgery of other parts of the body has taught the plastic surgeon. If they find a knee joint filled with infectious material, they clean it up there and then, remove the diseased part, and an immediate operation for restoration is performed.

Moristan is the big man of war surgery today, especially in plastics, in France. He has done some of the best work over there and we are watching his cases, his work, and his end results. We see in civil life the results of late plastic operations all the time, and

the cases in which contraction and retraction of tissue have taken place are particularly unsatisfactory cases to handle. We have to excise so much scar tissue, as a rule, that we waste tissue, and the results are poor. Immediate work is very essential.

Our government has organized schools in plastic surgery and is selecting the best men it can get to teach and study. At first a number of men were sent to the St. Louis, Philadelphia, and Chicago schools. They were not picked men, and some of them perhaps had never done a plastic operation. When you talked to them about plastic surgery they did not understand it; they did not know what you were talking about. It will take some time for a number of these men to grasp the situation with reference to plastic surgery in order to be able to do the best work.

The three principles I would like to reiterate with reference to plastic surgery are these: immediate work, a knowledge of using transplants, and that the actual cosmetic reconstructive work will have to be done subsequently. It is not possible to think of doing the complete operation at the time when the first repair is done. I think it is perfectly clear to you that the army officer is anxious to have his wounded men restored and returned to the firing line as quickly as possible. Operations which will prevent secretions from running over the individual's face and render him fit to return to the firing line as soon as possible will be the operations selected, and not a beautifying operation. The final results must be obtained later. That is the message of future plastic surgery I wish to bring to you this evening.

Plastic operations among the civilian population are those mostly performed for cosmetic purposes. If I may be pardoned for making such an uncomplimentary remark, I will say that the majority of these people are not in need of any cosmetic correction, but it is a mental disease with them. Most of the people I see of that type are neurotic men more than women. The men are the worst; they want to have their noses corrected in order to beautify or improve their appearance. They either want a piece of one side of the nose taken off or have a saddle nose corrected or a nostril made smaller or larger, or the tip less pendulous, or an ear less outstanding, or not so drooped. If the color is not proper, and does not harmonize with the rest of the face or the makeup of the individual, they want to have it changed if possible. Those are the people who make up

the greatest number of applicants for correction by cosmetic surgery.

As long ago as 1905, when I presented paper on external operations for the correction of nasal deformities before the American Laryngological, Rhinological and Otological Society, at Pittsburgh, I made a plea to the specialists and surgeons who were interested in plastic surgery not to turn these people away as mirotics for this reason: I found, after speaking to these unfortunate neurotics and trying to make them see life in the right direction, and told them that they did not need correction of their nasal deformity; that their noses were all right; I found that they would not listen to reason. Rather than refuse to operate upon them, because I knew they frequently fall into the hands of unscrupulous people who would operate and ruin their faces and fleece them of a large amount of money for doing it, I suggested to the members of the American Laryngological, Rhinological and Otological Society that they should operate on them. I received but one reply in open meeting, which was in favor of what I had stated, and none opposed it. But I received a unanimous reply in the anteroom after the meeting, and they all agreed with that point in the paper. They thought that then it was too early to try it out, but gradually it has become the consensus of opinion that these people should be handled as neurotics, and if they cannot be dissuaded from this foolishness, it is far better to operate on them with the proper understanding on part of members of the family or themselves that they are assuming all of the responsibility so far as the cosmetic result is concerned. I have seen this: no matter how good was the cosmetic result obtained, some of them will come back to you and ask you to do a little more correcting in the way of elevation, or a little bit more widening or marrowing. There is always something else they want done. Such people constitute the largest number of cases that come to us, and unfortunately make up the largest part of the reports found in oto-rhino-laryngologic literature.

I seldom find men in my specialty who busy themselves with reconstructing noses, faces and ears outside of this particular cosmetic field that I am talking about, but I hope they will soon get busy and realize its importance, because they will have ample opportunity to do good work along these lines.

I shall pass these photographs around; you can see what they are from the legends attached to them. These are pictures taken from cases in my own practice and from the practice of Dr. Carl Beck, as well as pictures from other sources. The work of Moristan is represented in some of these pictures.

If there are any questions any of you would like to ask, I shall be glad to answer them.

PORCELAIN TECHNIC.

BY DR. GEORGE A. THOMPSON, CHICAGO.

(Continued from March Number.)

For convenience of presentation I have divided my subject into three parts:

- (a) Porcelain jacket crowns.
- (b) Porcelain inlays.
- (c) Remodeling and staining of teeth.

Porcelain jacket crowns:

1. Radiograph.
2. Careful study of the case.
3. Appointment.
4. Removal of enamel.
5. Fitting of band.
6. Cutting shoulder.
7. Toilet of preparation.
8. Selection of shade.
9. Impression of root.
10. Bite.
11. Reproduction of root.
12. Securing of model.
13. Wrapping of platinum.
14. Packing of porcelain.
15. Baking.
16. Trimming of porcelain.
17. Testing the fit in the mouth.
18. Removal of matrix.
19. Cementation.

20. Removing of surplus cement and polishing.

Porcelain inlays:

1. Preparation.
2. Model construction and securing matrix.
3. Packing of porcelain and shading.
4. Baking.
5. Cementation.

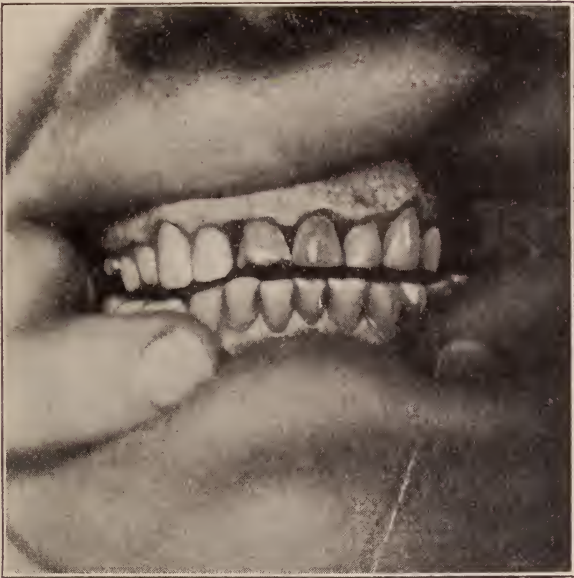


Fig. 1.

Badly discolored central with loss of contact and resulting injury to soft tissues.

Remodeling and staining of teeth:

1. Why remodeling is needed.
2. How it is accomplished.
3. Stains for various teeth.
4. Baking.

The advantages of the porcelain jacket crown are so numerous that papers of great length could be written upon that subject alone. Taking into consideration the fact that no crown put out by the manufacturer of the present day will meet the requirements of making a restoration that will not be detected by the laymen, even if this were the only advantage of the hand-carved

porcelain crown, it would be enough. But to this must be added the positive absence of gingival inflammation, no roots perforated, no split roots, and no pulps sacrificed. Properly constructed they have greater strength than any other type of crown.

FIRST CONSIDERATION.

Radiograph of the Tooth—If the patient is referred to me for

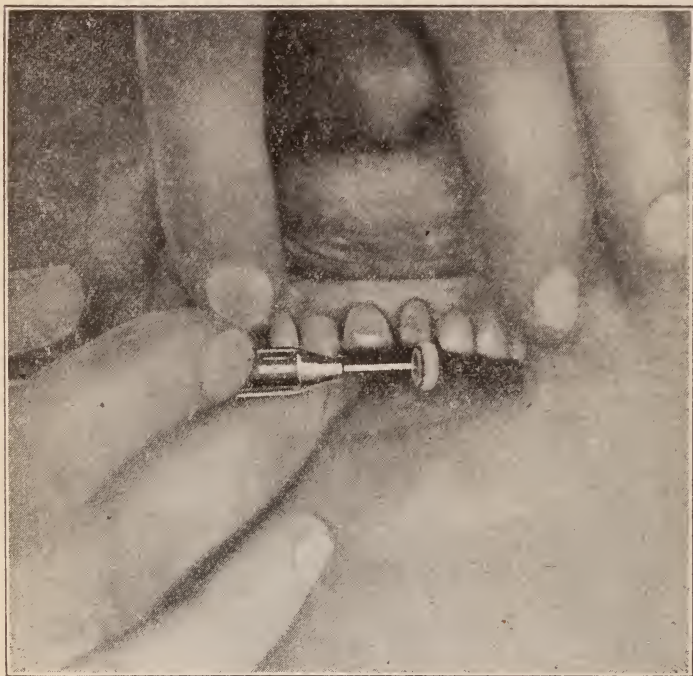


Fig. 1A.

The incisal can be cut down the first cut or it can be cut after the removal of enamel.

a single crown and the tooth is pulpless, or if the patient comes to me through the regular channel, referred by someone other than a dentist, I make a radiographic examination of the entire mouth—then, with the patient, the radiographs are minutely gone over and the case carefully planned.

Appointment for porcelain work should never be made later than three o'clock in the winter months and four o'clock in the summer months—for the reason that the shade should be selected under as nearly ideal conditions as possible. On extremely dark

days I cancel these appointments or make my selection of shade on another day.

The removal of enamel can be accomplished on any of the anterior teeth in ten minutes, if the technic is carefully followed. The old idea that the stone should be kept cool is decidedly wrong. The use of hot water was first called to my attention by Dr. A. F.

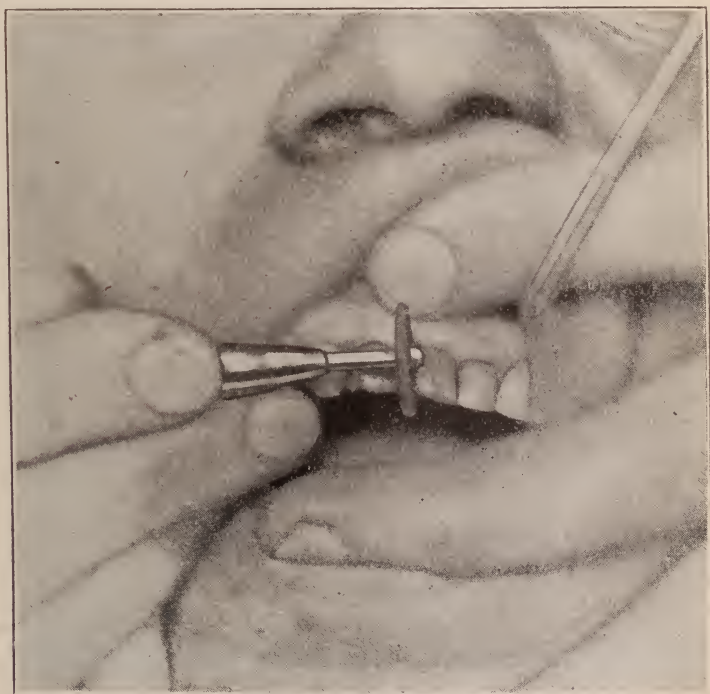


Fig. 2.

With knife-edge stone making line cut from incisal to gingival.

Merriman, Jr., of Oakland, California, about three years ago and it works marvels. He has a device for applying a constant stream of hot water under pressure directed upon the tooth during the operation. The stream is under control of the index finger and the water is drawn constantly away from the mouth by the saliva ejector.

With a one-half inch stone, cut about two mm. from the incisal. Use a one-half inch knife edge, Jim Dandy carborundum stone in a small mandrel, making a line cut from the incisal to the gingival,

about one mm. from the mesial and distal on the labial and lingual. This cut is made in the enamel to the dentin but not into the dentin. Then, with an enamel hatchet as a lever, break out the enamel. This will denude the proximal surfaces. Make another cut about one mm. in from the enamel margins as before and break away. Carry this procedure across the labial and lingual. Then with the end-

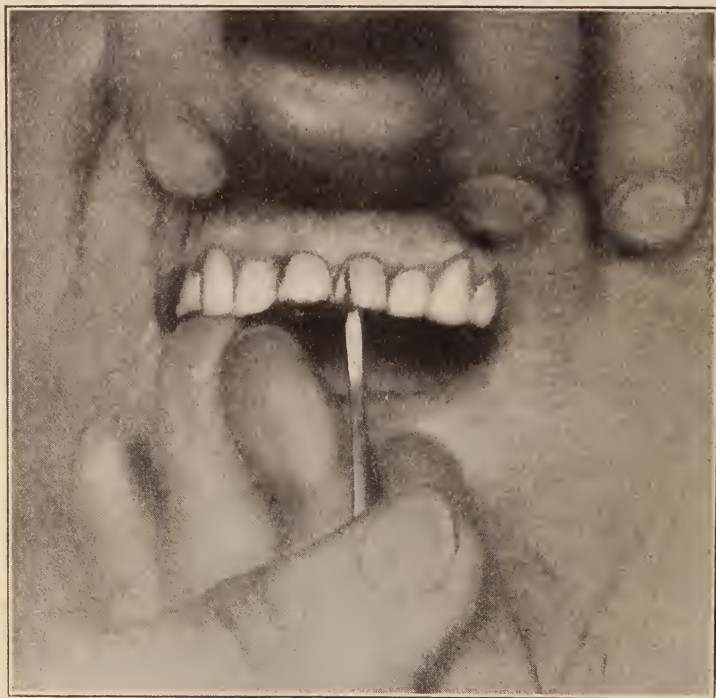


Fig. 3.

With enamel hatchet or straight chisel used as a lever the enamel is broken away.

cutting bur or plain fissure, square up the enamel that remains around the tooth and with enamel cleavers it will fracture easily. I have a special set of enamel hatchets, fifty-four in number, designed to reach any angle without laceration, but sufficiently strong to remove the enamel with ease. The trouble with most enamel cleavers on the market is that they are too large to use properly, without injury to the gums, but many of the pyorrhea instruments make excellent enamel cleavers.

The enamel rod direction at the gingival under the free margin

of the gums compels us to remove it entirely, if we are to have a perfect shoulder. Were we replacing it properly or not was a question. You can easily see that the thickness we remove and the amount we replace would have a bearing upon the tension given the soft tissues. I took a set of teeth and cut the crown off one mm. from the gingival line—measured each surface and cut off one-half



Fig. 4.

Show the various cuts in the enamel. One cut should be made at a time using the bulk to lever against to break out the thin section.

mm. more. I found that the enamel varied in thickness upon each surface and this variation was constant. It is impossible to reproduce this variation in thickness in a single banded crown—even if the men knew what the different thickness of enamel on each surface was.

The Blue-Island Specialty Company makes a seamless copper band which must be ordered in extra length (about one-half inch). It is furnished in twenty-four sizes. Select one which will accurately

fit the root at the gingival and is carefully trimmed to the curvature of the gum tissue.

The shoulder is cut with a plain fissure bar, No. 57 S. S. W. starting at the labio-gingival angle and cutting across the labial. Then start at the center of the lingual, cut to the mesial and through the proximal joining the labial shoulder. Start again on the lingual,



Fig. 5.

End cutting burs to square up the enamel so that the enamel cleaver will fracture the remaining enamel more easily.

cut to the distal through the proximal and join the labial again. The finished shoulder should be about one-half mm. wide, well under the free margin of the gums. A further refinement of the shoulder is made with a special set of instruments, cutting it so that it will incline inward and upward slightly toward the apex. This is an important detail.

Toilet of preparation is made with stones and paper discs. Carefully study the stress of mastication and shape the incisal sur-

face so that you will have a plane at right angles with this force. Then with a fine sandpaper disc, well coated with vaseline, polish the surface of the preparation.

A careful study of the illustrations will bring out the require-



Fig. 6.
Enamel cleavers.

ments of a proper preparation. On the bicuspid and molars the cusp formation is carried out to overcome the various applications of force in mastication and thus transfer the strain from the thin proximal surfaces of the porcelain to the preparation made in the occlusal surface at right angles to the applied force.

The selection of the shade should be made at this time, so that

the porcelain shade-guide tooth can be placed in better relation to the proximating teeth. Wet the teeth and guide-tooth while selecting



Fig. 6A.
Use of the enamel cleavers.

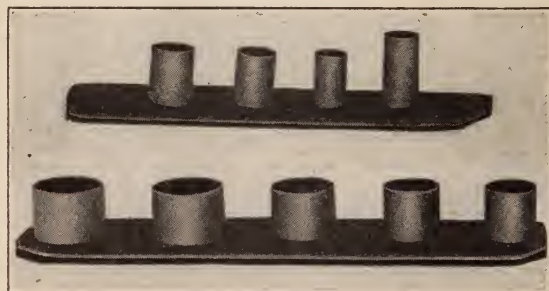


Fig. 7.
Seamless copper tubes.

the shade. A chart can be made to note accurately any little peculiarities or defects which you wish to reproduce, by drawing outline of

the labial surface, dividing it into mesial, distal and middle thirds—incisal, gingival and center thirds. Any third may be further subdivided and the location of a given area recorded.



Fig. 8.

Plain fissure bur used to cut shoulder.

Impression of root is secured by the use of copper band which was fitted before the shoulder was cut, used as impression cup. Fill with Kerr's modelling compound—dry heat over busson and vaseline slightly holding the finger over one end press into position that will be apically of the shoulder—chill with cold water and remove. Into the impression is packed copper amalgam building a root on the

preparation for convenience in handling. Some men use cement, but I prefer a metal. I have devised a split ring in which I can



Fig. 8B.
One central prepared.

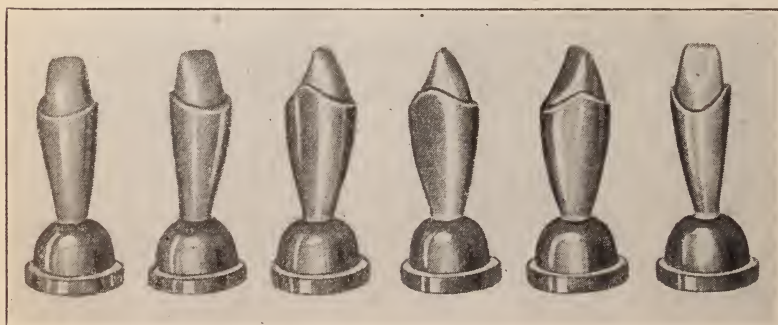


Fig. 9.
Study of preparation for centrals or laterals.

cast a root by taking impression in cement to which talcum powder is added to destroy its adhesiveness.



Fig. 10.

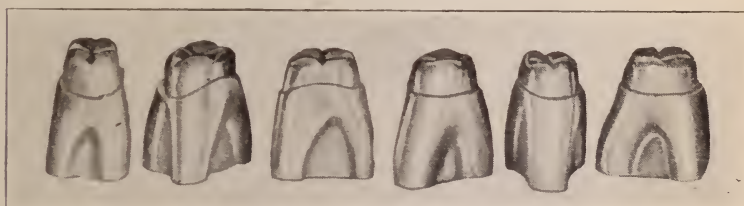


Fig. 11.
Study of molar preparations.

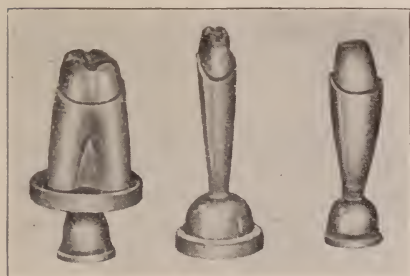


Fig. 12.
Comparative preparations.



Fig. 13A.
Buccal view
of bicuspid.



Fig. 13B.
Mesial view
of bicuspid.



14A.
Upper 1st molar,
mesial view.



14B.
Upper 1st molar,
buccal view.



15A.
Lower 1st molar,
mesial view.



15B.
Lower 1st molar,
buccal view.

Before dismissing patient the root is covered with a temporary crown, made of white base-plate gutta-percha. If the tooth is vital



Fig. 16.



Fig. 17.

Chart to map out irregularities to be reproduced on the crown.



Fig. 18.

Impression of the root is made with the seamless copper tube—which is trimmed to the curvature of the gums before the shoulder is cut.



Fig. 19.

Reproduction of prepared root placed in proper relation in the bite.

cement it in position. It serves to protect the tooth from thermal changes and holds the soft tissue in their proper position.

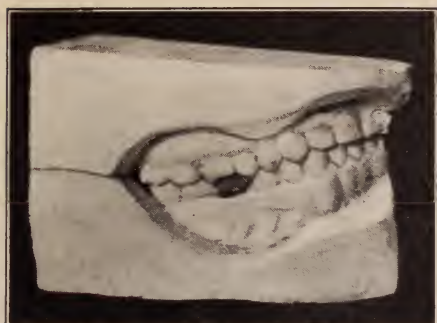


Fig. 20.

One way of running up model without articulator.



Fig. 21.

Finished crown in position.



Fig. 22.

First step in forming matrix.



Fig. 23.

Second step in forming matrix.



Fig. 24.

Third step in forming matrix.



Fig. 25.

Fourth step in forming matrix.



Fig. 26.
Fifth step in forming
matrix.



Fig. 27.
Sixth step in forming matrix.



Fig. 28.
By having the excess platinum on one side
one-half the length—we eliminate one thick-
ness.



Fig. 29.
Finished
matrix.

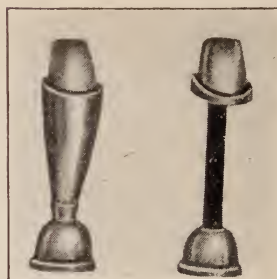


Fig. 30.
Matrix removed.



Fig. 31.
Trim the four or five
thickness of platinum to
one on the shoulder.



Fig. 32A.
Test the matrix to see if it can be removed without
distorting before placing on any porcelain.

The bite can be taken with a hard paraffine wax like S. S. W. "Tenex" or Kerr's compound. Bite with plaster impression is sometimes used.



Fig. 32B.
The matrix removed.

To secure model—the reproduction of root preparation is polished with discs, having it smooth and conical toward the apex



Fig. 33.
First application of color.



Fig. 34.
Shows the proportions of gingival and incisal colors to reproduce on the Justi guide.

and place in proper relation in the impression. Run up on the articulator. A hole is cut in the plaster model so that the root can be removed without destruction of any of the vital parts of the

model. The shape given the root should never be round, as it is liable to rotate.

The matrix is formed by cutting a piece of .001 platinum foil about one mm. longer than circumference of root at the gingival; it may converge toward the incisal and should be about three mm. longer than the distance from the shoulder to the incisal. The metal



Fig. 35.
The porcelain used in this work.



Fig. 36.
Central built to full contour.



Fig. 37.
Mesial of central built before baking.

root is removed from the model and the platinum is laid against the labial surface. It is roughly conformed here with the fingers, then burnished to the shoulder with burnishers. Holding the platinum firmly to the root with the second finger and thumb a triangular piece is cut from the mesial and distal incisal angles, which permits the central portion to be burnished over the incisal and down on to the lingual about one mm.

The burnishing continued around the mesial and distal surfaces conforms the platinum to the shoulder as well as to the surfaces.

bake to 2,500 degrees as before. Remove from furnace and place on the models. Examine carefully contact and occlusion.



Fig. 38.
Method of cutting out porcelain to overcome shrinkage.



Fig. 39A.

Study of carvings before baking.



Fig. 39B.

The occlusal is packed not carved as plaster is carved.

The next detail will determine whether you have a good or a poor porcelain crown. You remember the platinum matrix overlapped the shoulder toward the apex about one mm. for strength.

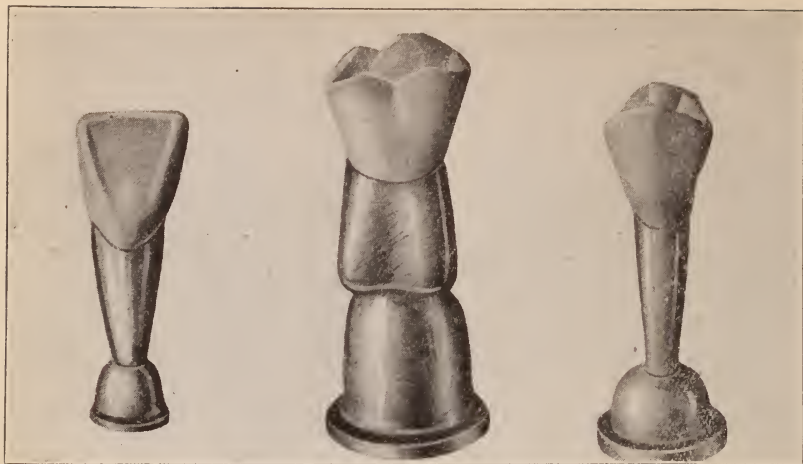


Fig. 40.
Study of carvings.

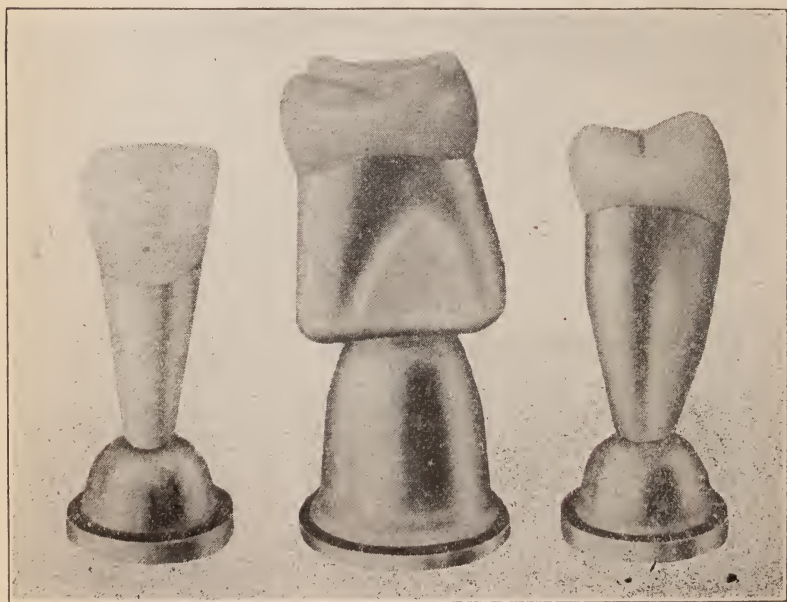


Fig. 41.
The finished crowns.

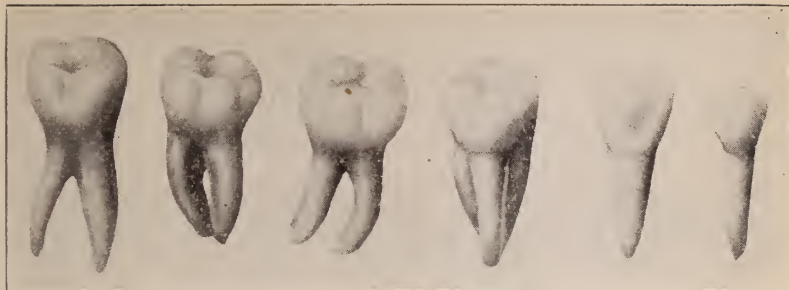


Fig. 42.
Finished crowns.

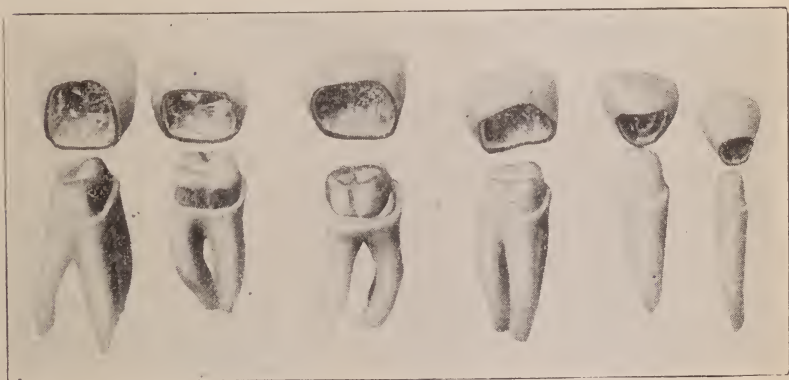


Fig. 43.
Finished crowns.

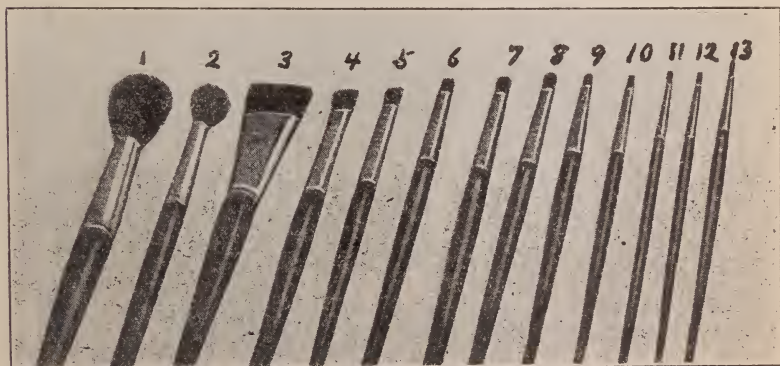


Fig. 44.
Brushes used in work.

This will bring the ends well around the lingual. With a pair of pliers the ends are grasped and brought together, the excess projecting at right angles from the surface. Trim away all but one mm. then trim the left excess to one-half mm. with cotton pliers—fold the one mm. over the shorter projection and burnish down to the

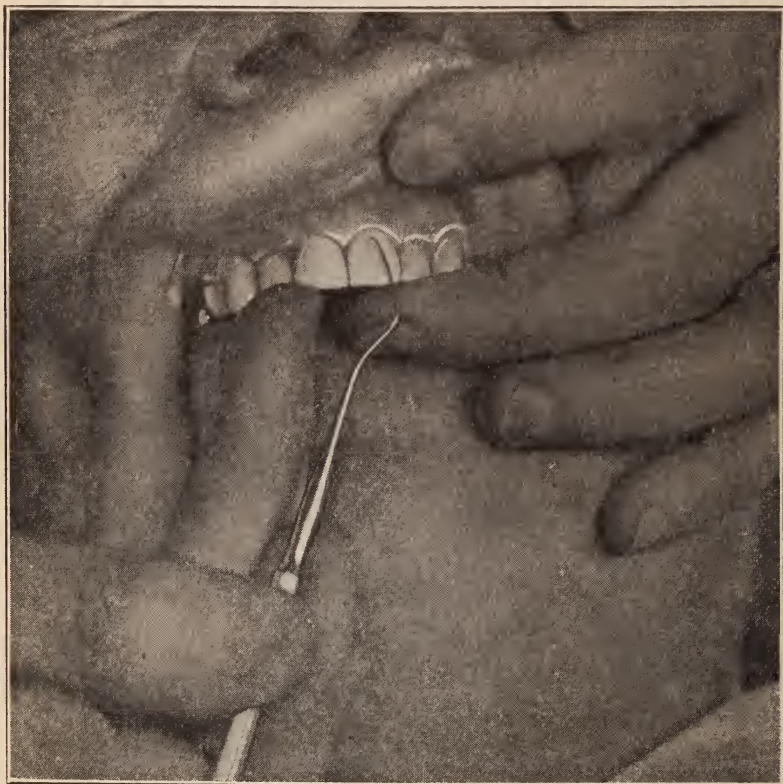


Fig. 45.
Testing the fit in the mouth.

root. Remove, trim all but about one mm. beyond the shoulder toward apex. Reburnish the entire matrix accurately and you will have a matrix which will be a positive fit and will stand all the handling necessary.

On the shoulder we have four thicknesses of platinum, which is reduced to one by grinding with a fine stone. Otherwise, when the crown is finished and the platinum removed we should have a

poor fit at that point. Test matrix to see if it can easily be removed before placing on any porcelain.

Overcoming the shrinkage of the porcelain at the gingival can be obtained in three ways—by painting shellac over platinum on the shoulder, by using a thin film of inlay wax in the same position,



Fig. 46.

Removing the fine particles with fine tape.

either of which will burn out clean leaving a space which will permit the platinum to be reburnished to the shoulder—before filling in with porcelain on the second bake. The other method is to cut it away with the packing instrument before the first bake.

The model is painted with amyl-acetate to prevent the plaster from absorbing the moisture from the porcelain. The first color, the gingival, is put on with the root in the hand, packing the porce-

lain to the greatest density, building up slightly beyond the incisal. The porcelain can be best worked by not having it so moist that it will run. Place the root in the model and lay on the incisal color, bringing the porcelain out to full tooth contour and occlusion—remove and add what is needed to the contacts. Carefully brush off loose particles from the carving and exposed platinum.

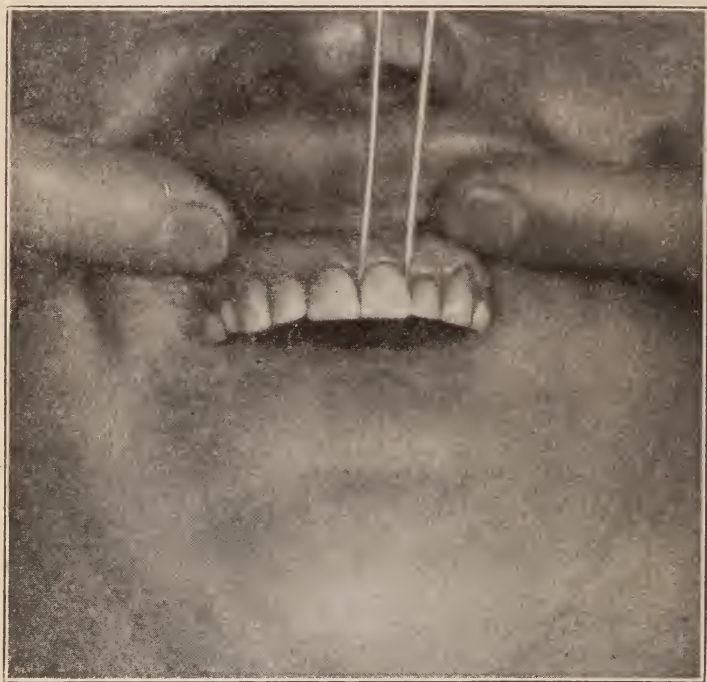


Fig. 47.
Removal of particles with tape.

Examine the furnace each time before using. Look at the thermo-couple connections. If it is poor the registration of heat will not be accurate. If the furnace has been moved or handled, see if the needle that registers on the pyrometer is on the figure 0—if not, set it with the corrector. The S. S. W. Electric Furnace with pyrometer and small muffle is the best for this work. The object to be fused is placed in the furnace with the current off. This is a precaution that might save trouble if the current were on. If the tongs were to touch an exposed wire it would result in burning out

the muffle. Throw in the knife switch—have the rheostat lever on button No. 1 when 1,500 degrees is registered on the pyrometer—close the furnace door. At 1,600 the rheostat lever is advanced two buttons at a time until 2,500 degrees which should be reached in about eight minutes. If the muffle is new the lever would probably be on button seven but as the muffle becomes older it may be necessary to go as high as button twelve or thirteen. If you are in haste, it is perfectly safe to remove the crown at 2,000 degrees, but be careful not to touch it with the furnace tongs. When the crown

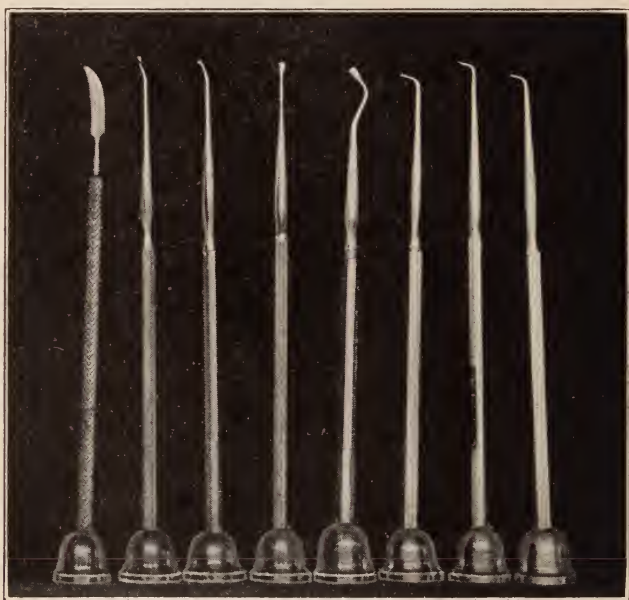


Fig. 48.
The finished crowns.

has cooled sufficiently to handle, place it on the root and reburnish the gingival. Pack the gingival porcelain between that which is already fused and the shoulder. Moisten the model again with amyl-acetate and place crown in the model—if any more porcelain is needed for contour and occlusion it is now added. Place in the furnace and The porcelain is baked flush with this platinum and the platinum is .001 larger than the root, therefore, the finished crown will be that much larger than the root in the mouth—unless it is corrected. Take a seven-eighth corborundum disc and cut away the porcelain and platinum around the gingival with the crown on the metal root. Clean the crown carefully by using compressed air and spray bottle—

follow this up by a good stiff brush and Dutch Cleanser. Place in the furnace and bake 2,500 degrees or 2,520 degrees.

The next step is to test the fit in the mouth. To do this do not remove the platinum. The crown is placed in position and a No. 17 explorer (which is a pull explorer) is passed up under the free margin of the gums beyond the shoulder and drawn incisally, passing around the root—if it catches, the porcelain is trimmed again until it is perfect. If it is necessary to trim the porcelain very much I



Burnishers and instruments.

would bake it again so as to have a glazed surface at that point. The matrix is removed by putting in water—then with a fine knife turn over a small piece at the margin—grasp with “K” tweezers and it will usually peel out in one piece.

Roughen the interior slightly with a fine stone and set with Fleck’s Cement, holding the crown in position with slight pressure. The bulk of the cement is removed with a straight explorer. The fine particles of cement are removed by a very fine strip passing through the mesial around the lingual and back again through the distal. Reverse this and the tape has entirely circled and polished the junction of crown and root.

Before using the strip, the saw-edges should be removed by drawing it over a fine stone. If this precaution is observed, the soft tissues will never be injured.

A CONSIDERATION OF SOME OF THE IMPORTANT INFECTIONS AFFECTING THE REGION OF THE MANDIBLE.*

BY L. SCHULTZ, D. D. S., M. D., CHICAGO, ILL.

Among the common lesions of an infective nature about the lower jaw in young adults we find infections about the third molar. Such infections frequently occur about impacted teeth which in the process of eruption have to a small extent pushed through the gums, thus creating a pocket of considerable dimensions where debris of food may become lodged, infected and undergo decomposition. This foreign material being an irritant and laden with pathogenic micro-organisms may cause such changes in the soft tissues, constituting the pocket, as will result in a breaking down of some of the tissue elements with an accompanying suppuration. Or the pocket may be formed by a normally erupting tooth while in that stage of eruption where an operculum of gum tissue still covers its occlusal surface or where the operculum having been absorbed the gums come up to the level of its occlusal surface at its distal portion at least and to a minor degree on the buccal and lingual sides. Again the infection may find its etiology primarily in traumatism as when in the process of mastication an already erupted upper third molar hits the gum overlying an erupting lower third molar.

Now infections of the nature just described are generally of a mild type, comparatively speaking, and while they may be attended by a good deal of pain and occasionally some trismus they usually yield promptly to appropriate treatment.

A picture, far different clinically from that just described, may be furnished by an infection due to death and decomposition of the pulp in a third molar, no matter from what cause, for here the

* Read before the Englewood Dental Society November 13th, 1917, and before the West Suburban Dental Society at Oak Park, Ill., January 11th, 1918.

deeper structures are involved. True the symptom complex may be identical with that of an ordinary alveolar abscess occurring anywhere in the mouth, but it may be and often is much more severe. The fact that the lower third molar is imbedded in the mandible proper and not in alveolar process, that it occurs at the most massive part of the jaw, that it frequently lies in close proximity to and sometimes in actual contact with the mandibular canal, that it is very deeply placed, sometimes even invading the territory near the lower border of the bone, and finally the arrangement of the deep fascia of the neck in relation to the mandible, all make probable a picture of a far more serious nature than that of an ordinary alveolar abscess, grave as they may become.

Based on these premises one may expect a given infection in that territory to be more painful, to be of longer duration, to cause more constitutional disturbance, and prone to be attended by graver consequences than an abscess originating in an infection about the apex or apices of some other tooth. In the first place the territory invaded differs from that about the apices of the other teeth in that this part of the mandible is the heaviest, hence in the suppurative process the pus has to burrow through more bone to get to the surface of it, which prolongs the period of intense pain, that the patient has to endure.

The pathway of least resistance also plays quite a role, for if the pus makes its way through the overlying soft tissues and "points" in the mouth, either buccally or lingually, it will prove as amenable to treatment as the ordinary abscess developing about the root end of any other tooth and "pointing" in a similar manner. Nor does pointing of a third molar abscess below the angle of the jaw add greatly to the difficulty in treatment, for a simple external incision in the shadowline usually clears up a case of that kind, with disfigurement no greater than an almost invisible scar, the width of a line and the length of the incision. Should the abscess, however, develop at a point so near the mandibular canal as to directly irritate the mandibular nerve, or should it originate in the canal itself, it would obviously be likely to give rise to a great deal more pain, not only at the site of the disturbance, but reflexly in other parts as well. That patient may complain of pain in the other teeth on the side involved, both upper and lower, he may complain of earache, eyeache and most likely of headache, or that entire half of the head

may pain, or again he may complain of pain down the side of the neck or even in the arm.

But the most serious path of least resistance that such an abscess may take is that between the deep layers of the cervical fascia—say between the fourth and fifth layers, also known as the middle lamella and and prevertebral lammella respectively. This may lead to disastrous results unless attended to early. As you know the fourth layer of the deep cervical fascia passes behind the Sternocleido mastoid muscle and lies in front and forms the anterior wall of the carotid sheath which contains the carotid vessels and the internal juglar vein and this layer extends down into the superior mediastinum and becomes continuous with the fibrous layer of the pericardium. Extension of a suppurative process then finding its way into that compartment may lead to mediastinal abscess and death.

The question of toxemia, established by absorption of noxious material from the abscess contents, is also of importance. That such absorption does take place is well known and the symptom complex, which it produces, is also well known. It is characterized by certain constitutional disturbances as malaise, rise in temperature, anorexia, nausea, vomiting, scanty highly colored urine, cachexia, etc. This expression varies in intensity in different cases from a scarcely noticeable deviation from normal to an intense septicemia and death, depending on certain factors involved. Among these are the following: The virulence and number of the invading organism, the resistance of the patient to the infection, the character of the tissues involved, the ability on the part of the fixed tissue cells to wall off the infection, etc.

I have mentioned impacted lower third molars in the beginning of this paper and I wish to refer to them here again for the purpose of emphasizing the fact that in those cases infections are prone to be more virulent and may sometimes even lead to necrosis of the bone due to a shutting off of the blood supply to the part. I recall a case in practice in which I saw the patient late in the course of the disease and found both second and third molars held together by a sequestrum and floating in a lake of pus. Removal of the dead mass led to a prompt recovery.

I do not think that there is a man in this room tonight who would regard the making of a diagnosis of any one of the pathological

conditions mentioned so far as a difficult task and yet a great deal of confusion may sometimes be occasioned by such a simple matter.

To illustrate I will cite another case from practice. A woman was referred to me by one of my former medical students, now a successful practitioner of medicine, for the purpose of diagnosis and treatment. She came with the following history: About six weeks ago she developed a good deal of pain, also some swelling in the back part of her mouth on the left side. The pain was of an intensity sufficient to keep her from sleeping. She went to a physician who, after examination, told her that her throat was all right but her left lower third molar needed extraction. So she went to a dentist who examined her and told her that he knew there was nothing wrong with her third molar but that she had a disturbance on that side of the throat, which he could not diagnose, but for which she should see a physician. So she went to physician No. 2 who made a similar statement to the one his confrere No. 1 had made and sent her to dentist No. 2. The latter followed the example of his predecessor in the case and sent her to physician No. 3, who in turn sent her to dentist No. 3. Again she was referred to a physician with a statement similar to those made by his predecessors. A regular case of "shifting the burden." Finally she went to the physician who referred her to me. After giving him that history he refused to examine her, but told her that he would refer her to a man who, being versed in the diseases of all those structures, would not send her to some one else.

Before proceeding further let it be said that everyone of those dentists involved in that case was right and every one of the physicians, except the last one, who would not examine her, was wrong, because a little questioning, just getting a little more data to obtain a real case history and an examination of the parts showed a nice little chronic peritonsillar abscess. What this woman needed and received was an opening of that abscess under local anesthesia and the evacuation of the pus, rather than some excuse and passing her on to a dentist. When she returned the next day to have the drain removed she told me that she had had the first good night's rest in six weeks, and she looked it. The expression of pain and fatigue and nervousness had vanished from her face overnight. So I say that sometimes a great deal of confusion may arise over a simple matter.

This brings me to a consideration of the treatment of these lower third molar disturbances. And let me say in the beginning that extractions of teeth involved in an acute infection are usually best postponed until the abscess is drained and the swelling reduced. Note, I do not specify lower third molars, but include all teeth so involved. I am well aware of the fact that extraction of such teeth is practiced but the longer I am in practice and the more I see of the consequences of such acts, the more I am convinced that such treatment leads to disaster in the long run.

The fact that extraction means the making of a breach where the attempt at localizing the process is being made by nature, or where the process has been successfully localized, that it means trauma with subsequent reduced resistance of the tissues to invasion, and last but not least, that it means the opening of the cancellous bone cells in the spongiosum, inviting entrance of the invading organisms directly into the blood stream and lymphspaces, far overshadow what benefit may accrue from a drainage which is often a drainage in name only. For what drainage can one hope to get through the socket of a tooth in a case where the infection resides in the bone outside the periapical space, or where it has reached the periosteum and overlying soft tissues?

That some of these cases, so treated, recover in spite of such treatment I freely admit, but that lots of them are exposed thereby to unnecessary danger and disability is equally true. I see cases quite frequently suffering from the consequences of such acts and as an illustration will cite the history of one of a number of cases which recently came under my observation at the hospital: Patient, male, walked into ward examining room about 4:10 p. m., October 11th, 1917, complaining of difficulty in swallowing, pain on the right side of his face and showing a large swelling of that area. Patient stated that about three weeks ago he had a slight swelling on that part of his face. He went to a dentist who extracted a lower right molar tooth, which he said caused the trouble. Swelling increased in size and pain became more intense after the extraction and soon he was unable to open his mouth.

Examination: A large swelling is apparent, extending from the temporo-mandibular joint down to the clavicle and laterally from about the median line to the mastoid region, where it causes the auricle to stand away from the head. There is a distinct area

of fluctuation in the tumor. Patient looks septic and has trismus to an extent which precludes an examination of his mouth. His T. is 102:2, P. 100, R. 20. Examination of the chest reveals no heart murmurs, lungs—no râles. Abdomen, extremities, reflexes, eyes, ears and nose give no abnormal findings.

Under nitrous oxid anesthesia an incision was made at the most dependent point of fluctuation. This incision, was carried through the skin only, the abscess being opened by blunt dissection. About two ounces of greenish yellow pus was evacuated. A gutta percha drain was inserted and hot compresses ordered to be renewed every hour.

His temperature chart shows the following:

T.

On Oct. 12th	100:2—99:8
On Oct. 13th	100:2—99:8
On Oct. 14th	98:6—98:6
On Oct. 15th	98:4—98:6
On Oct. 16th	99:2—98:6

I saw him on that day, removed the drain and ordered temperature, etc., taken every four hours with the following result:

Oct. 17th	99:8—99:6
	100:6—100:6
Oct. 18th	101 —100:6
	101
Oct. 19th	101:8—101:4
	101:2—103

When drain was replaced and quite a bit of pus evacuated patient complaining of a pain.

On the 20th	101:8—101:2
	102 —103

Patient became so toxic that intern called me over phone.

I found patient quite septic, swelling had increased enormously since I had seen him last so that his right eye was closed. I opened the wound freely, inserted an iodoform gauze drain and ordered *real large fomentations*. I told the intern to call me if no improvement resulted by the next day, when I intended to open his mouth under general anesthesia and establish through and through drainage. However, patient improved, temperature gradually decreased until it was practically normal and he was dismissed on October 30th.

Having made my position clear with reference to extraction in the presence of acute infection, let us briefly consider the treatment of the cases described above.

First, cases presenting with infected pocket around a lower third molar. Wash out pocket daily with an aqueous solution of 1 per cent tincture of iodine or better still with normal salt solution, or alternate between the two until inflammation has quite subsided, then extract the tooth. If the disturbance is due to an upper third molar traumatizing the gum about the lower third, extract the upper molar, and when the inflammation about the lower tooth has cleared up, extract it. An abscess on a lower third molar due to a septic pulp or rootcanal should first be drained and when pericementitis has subsided and tissues about tooth are in a quiescent state the tooth should be extracted.

The technic of tooth extraction is one with which you are all so familiar that I shall pass over that phase of the subject, although a few moments spent in consideration of the anesthetic to be employed, will, I believe, be profitable. I think that you all know what an enthusiast I am, when it comes to a Nitrous Oxid and Oxygen anesthesia or analgesia and if anyone present does not know it, I will freely confess that I am. For it has some advantages over local anesthesia, among which are quickness of action, less psychic depression, less shock, freedom from danger of infection via the needle route, etc., so I will say that it is the anesthetic of choice for certain operations.

But what are we going to do with the hard cases, such as cases of impaction for instance? Personally I am just as much of an enthusiast over local anesthesia in those cases, as I am about Nitrous Oxid and Oxygen anesthesia in other types of work. In cases of impaction for instance, one would not think of Nitrous Oxid and I prefer a local anesthesia in the office to an ether narcosis in the hospital, whenever conditions warrant.

The advent of Novocain has been a great blessing, but since that valuable agent is German property and hence cannot now be imported we are fortunate in that we may procure an agent as good as Novocain made by Americans and in America. I refer to Apthesine. This agent, when first produced, was tried out by its manufacturers on animals, etc., and its dosage, action

and toxicology established as far as that was possible. Then a number of men were selected in the principal cities of the United States and asked to try out this agent, which in the laboratory and animal experiments had shown similar properties to Novocain. In Chicago five men were selected to try out Apotheresine and I experimented with it on patients in the clinic, the hospital, and finally in the office, using it as I would Novocain and with just as good results. The anesthesia was just as deep and if anything came on a little more quickly than did that of Novocain.

Now I have the statement from the manufacturers that Apotheresine is not a derivative of Cocain, that it is a synthetic product, just like Novocain, and I will say that just as soon as my present supply of the latter drug is exhausted, I will use Apotheresine, for it is now on the market in tablets of different strengths. I may say that the reports from all the men trying out this agent were uniformly good and that that was the factor which finally determined its manufacture. So let me suggest that any of you finding it hard to get Novocain now, try Apotheresine and you will like it.

But to return to our subject proper. There are some infections about the lower jaw which are harder to diagnose, perhaps, and which often do not respond so readily to treatment, and of those I would mention first of all the so-called subperiosteal abscess. This is an ordinary pus infection, say a staphylococcus infection, either of not sufficient virulency to break through the periosteum or confined between the periosteum and bone, because the former is too tough to yield on the one hand and too easily detached from the bone on the other.

Such an abscess may easily be mistaken for a fusiform bacillus infection, because the swelling resulting appears as a hard, brawny mass, but in subperiosteal abscess you can get deep fluctuation, whereas in a fusiform bacillus infection such deep fluctuation does not exist. A differential diagnosis is of first importance, because the treatment of one is vastly different from the treatment of the other. In subperiosteal abscess the treatment consists in prompt drainage by free incision through the periosteum to the bone, or necrosis of the bone involved with the loss perhaps of a number of teeth may be the result.

Infection by the bacillus fusiformis usually shows itself as a slowly progressive swelling, which may attain large dimensions and which is characterized by a "woody" hardness. It may involve any part of the jaw. The tumor is hard, brawny and there is no area of fluctuation. When due to the bacillus fusiformis only there is no pus.

Treatment relates to the administration of cathartics, keeping the patient in bed, on a liquid diet and the application of boric acid fomentations, until all swelling has disappeared. Resolution is usually very slow and fomentations must be persistently applied until all induration is gone.

Should treatment be discontinued while a small area of induration remains, even though it be the size of a marble only, there is very apt to be a recurrence of the mischief. I was called in on a case of this kind in a hospital recently and found the patient with an enormous swelling, beginning behind the right mastoid process and extending down to the root of the neck, coming forward involving all of the neck on that side, extending up on the face to the region of the Zygoma and ending on the left side in the bicuspid region. The prominence of the nose was obliterated on that side. The entire mass was hard, woody, brawny, unyielding. Under the treatment outlined above the swelling began to go down on the third day, but it was over two weeks before the tissues involved had returned to normal.

Another case showed involvement of the right lower jaw. In this case a number of recurrences had been experienced, due to the fact, that whenever the induration was almost gone, the man returned to work, only to be obliged to quit again when the next outbreak occurred. In this case it seemed impossible to get all the induration to pass away, so I advised Roentgen-ray treatment; finally an abscess developed in the soft tissue, which I incised and drained. This, I firmly believe, will result in a permanent cure and up to this writing I have not heard from him again.

The fusiform bacillus figures in a number of other affections of the lower jaw. Blair found this organism in some cases of Chronic Ulcerative Stomatitis, although he found it in symbiosis with a spirochete, which seems to be the same organism known as Vincent's spirillum. This latter organism is found in sym-

biosis with the bacillus fusiformis in Vincent's Angina and, indeed, some writers take the position that this latter disease and chronic ulcerative Stomatitis have an identical etiology but occur at different sites.

Vincent's Angina affects the tonsils and fauces, sometimes extending to the gums. It begins with a sore throat followed by a necrosis of the mucosa and an ulceration of the subjacent tissues, involving that tissue to a greater or lesser extent and to varying depths. The necrosed mucosa forms a kind of a grayish white pseudo-membrane covering the ulcer.

When the membrane is removed the underlying bleeding ulcer comes into view. It is irregular in shape and malodorous. The lymphglands draining the territory are involved in the process and become enlarged. There is usually some elevation of temperature.

Treatment consists in the daily application of powdered methylen blue, the use of normal salt solution as a mouth wash, alternating with a Permanganate of Potash solution to remove the feter. A few days' treatment usually clears up the trouble.

There is just one more form of infection that I wish to touch upon in closing and that is an acute progressive cellulitis beginning in the floor of the mouth and submaxillary region. I refer to Ludwig's Angina. This, I know, is fortunately a rare disease, but is of interest because its mortality is from 35-40%. This infection is characterized by a sudden onset, a rapid infiltration of the cellular planes of the floor of the mouth converting these structures into a hard, woody mass which is exceedingly painful. The swelling sometimes causes the floor of the mouth to rise to a level with the occlusal surface of the teeth and this forces the tongue up and back. An extension of the process backward may lead to oedema of the glottis. While there may be spontaneous resolution there is more frequently a development of grave sepsis and a fatal ending in from ten days to three weeks, if the case is not treated promptly and vigorously. A pneumonia may complicate matters. The organism believed to be the causative agent is a Streptococcus.

Diagnosis rests on the sudden onset and the finding of a sensitive, hard, woody swelling extending from the chin to the angles of the jaw, binding the jaw together by this board-like

mass, the floor of the mouth often coming up to a level with the lower teeth.

It is differentiated from subperiosteal abscess by its location and the area involved and by the fact that no deep fluctuation can be elicited when seen early, while in subperiosteal abscess there is deep fluctuation. From a fusiform bacillus infection it is differentiated by the mode of onset, the location and the exquisite tenderness.

Treatment consists in early and adequate drainage. This is best accomplished by free incisions into the indurated mass, searching for pus with roundnosed artery forceps, and the insertion of drainage tubes. Should dyspnoea develop in the absence of a pneumonia a tracheotomy should be done to relieve the patient.

In closing, let me invite you to a lively discussion of the topics presented so that we may all derive the greatest benefit possible from this meeting.

25 East Washington St.

DIRECTING THE DENTAL WORK AT GRANT PARK NAVAL TRAINING STATION.*

WHAT I LEARNED AND WHAT I TAUGHT.

BY LIEUTENANT B. J. CIGRAND, M. S., D. D. S., DENTAL DIRECTOR AT THIS
STATION.

It is a distinguished honor you pay me in requesting that the society and public as well shall hear of my findings at the Recruiting and Training Station as operated by the United States Navy. I shall not burden you nor take the time to detail to you the modern dental equipment and the dental offices on the steamship *Commodore*, but dismiss this topic with the remark that its unique quarters as well as the character of the patients was a source of both delight and inspiration. The other six interested operators can cheerfully testify to the hearty support of both the Captain and the medical officers; harmony reigned supreme, the Navy Department having appointed me

*Public lecture under the auspices of the Northern Illinois Dental Society, at Dixon, Illinois, Wednesday evening, at 8 o'clock, October 17th, 1917.

the chief or supervising dentist with practically full power to act. It was a delightful opportunity to get a phase of experimental and observation knowledge, which could not, under any circumstances, be brought to the general practitioner.

I made it my business to frequently call at the Recruiting Office, also on the ships, and assist in determining the fate of the candidates and after diligent investigation with the records, found items of superlative value to not only the dentist, but to the public in general.

Let me recite briefly these deductions: About 40 per cent of the men presenting themselves were refused because of poor teeth, and also that about 40 per cent of these same refusals came from poor eye sight or enfeebled optic nerve.

Now, Dr. Charles A. Costello, the Chief Medical Adviser and Surgeon, noted that there was a relationship between disturbing teeth and defective vision, and in my "Once a Week" lecture before the entire encampment, I made the following statement which induced the following editorial in "The Binocular," the Naval Journal:

VITALLY IMPORTANT.

Men of Grant Park Naval Training Station cannot devote too much attention to this subject of "teeth" as set forth and emphasized so finely by Dr. B. J. Cigrand in a splendid address before the entire encampment recently. Time and attention directed to the care of the teeth and mouth cannot be better spent, was in substance pointed out by the surgeon and the deep and concerted interest which Dr. Cigrand has taken in the Naval men of Grant Park is appreciative in no small measure.

That the health, vigor and even patriotic service of the bluejacket depends on his power and perfect dental organization, was news to the majority of the men of the camp, but the manner in which Dr. Cigrand proved his statement was most convincing. Impaired eyesight as the direct result of defective teeth was another essential point upon which the speaker dwelt. In this connection he referred to the valued finding of Dr. Costello, who reports that in his examination of thousands of recruits and prospective applicants for the U. S. Navy, when he has found a mouth in abnormal condition and the teeth decayed, he invariably noted an enfeebled optic nerve or power of sight.

His finding in this matter, as set forth in *The American Journal of Public Health*, appearing in *Current Opinion* of August, follows:

"The minimum requirements of twenty sound teeth, of which there must be four opposing molars and four opposing incisors, with crown and bridge-work counting as sound teeth, are fair, and a man's mouth could hardly be considered in good condition, without conforming to this requirement. A peculiar coincidence I have noticed in the examination of applicants who have defective teeth is the frequency that defective vision is present in the same individual; from this, I am led to believe that the man, with a mouthful of decayed teeth, develops a toxin which in some way is partially responsible

for the condition of his eyes. Teeth, as we now understand them, are the cause of many of our ills, and as it is necessary for a man in the Navy to be in a constant state of good health, his teeth must be in good condition, otherwise, he is a victim of his own toxins; and living as he necessarily has to, in confined quarters aboard ship, he is less resistant to outside infections, as well as a menace to other members of the crew, through common use of the same drinking fountains and as a bacteria carrier, men of this character are not desirable and must be rejected temporarily until they have the proper dental work done."

And all this goes to emphasize the essential item of keeping your teeth in condition, thus assuring against a positive loss to naval efficiency.

As an added precaution against any defects of the mouth, Dr. Cigrand made it possible to provide each man of the camp with an eight-ounce bottle of mouth wash to be used daily and refilled when empty.

Closing his helpful and interesting address, Dr. Cigrand said, "The splendid mouth condition which we hope to attain in this entire encampment is practically assured since in your earnest attention and the harmonious, eager co-operation of Captain Evers and P. A. Surgeon, Dr. Costello, these good things can be clearly foreseen."

The importance of good eyesight is only equaled by the necessity for good dental organs. It was later also determined that a rejected candidate was easily and speedily restored in eyesight, once the distressing teeth were placed within normal condition.

While the incidental connection between disturbing teeth and optic deficiency has been noted by investigators, the broad, bold statement that poor teeth and poor eyes are twin circumstances, will be news to dentists as a class.

This find and deduction places our service in a higher strata of human usefulness, and places an added responsibility on our calling and will quite likely induce Dental Colleges to have the science of Optiology included in the course and a dental chair added to faculty service in the schools of Ophthalmology.

I shall have enumerated by foot notes kindred references which support the deduction that the dental organs when abnormally found, exert a depressing influence on optic strength.

At another "Once a Week" lecture before the entire encampment, I admonished all the Jackies not to be content with the satisfying thought "my teeth do not ache, I can eat comfortably, hence need no dental attention," as I had ordered that, regardless of the fact that the medical examiner had pronounced your teeth "up to requirements," every individual should report for dental examination of a rigid and minute character, and I impressed the thought that they were not personally or individually capable of knowing whether their teeth were in perfect order; besides, lack of pain did not necessarily mean perfection of dental

organization. This idea I drew out into definition form by stating:

It may be news to many readers to know that a child or an adult may be physically injured and not be aware of it nor have the slightest mental record of any injury; and since this assertion may seem strange and even impossible, I will cite you a number of instances where the human body may be seriously impaired and yet the person be absolutely unaware of the slightest pain. Various disorders of the eye, which threaten the sight, may be present and not the slightest particle of pain be noted. Tuberculosis may be ravaging in tissue and bone and be progressing rapidly, yet pain records in the mind be missing. Bright's disease and insanity, too, do not in many cases induce suffering. Some of the most devouring forms of both internal and external cancers may be in activity and give no impression in the mind or in the brain; yet in the short space of ten hours, claim the life of the victim. A pus-oozing ulcer may for years go on discharging its dangerous germs into the mouth, the person swallowing the life-destroying lower forms of existence and not be aware that in the diseased jaw a most terrific battle is on in the hope of fighting off the invading hosts of poisonous germs. Even a nerve of a tooth, called the pulp of the tooth, may be nearly uncovered or exposed and nature may be gradually depositing on the inside of the pulp canal, at the seat of exposure, secondary dentin, to thus cover again and shield that near denuded nerve, and yet, while this injury exists, and while this repair work is going on, the person be unaware that there is the least bit of trouble, just because no pain is experienced. Hence, the point I wish to impress upon your mind is that injury, disorganization, may be present and going on, yet you will not have pain. Do not always wait to be alarmed by the clock striker called pain.

Look about, look into and examine your teeth before that pang of alarm awakens you. What machinist would wait for the squeaking of his machine before oiling? Oil before the squeak comes. What man would wait for the explosion, or spitting of a puncture in his auto tire, No, he examines beforehand and repairs in advance, preventing a puncture, blowout, or explosion.

Why not give the human machine, for machine it truly is, an equal attention?

Then observations on the general condition of the dental fabric were noted. Boys were coming in with tender gums, others with sore spots between the teeth, and a few hurried, believing they were afflicted with pyorrhea alveolaris. The most of them presented inflamed gums and various causes were attributed. The changed conditions of both food and the cool breezes from the lake, together with the many "sweet boxes" from some one in America, all presented their claim for the distressing gum tissue. But the careful microscopic investigation of a fractional part of the swollen, reddened and tender gum tissue revealed the presence of small particles of wooden slivers from the "lumber yard tooth pick."

The quartermaster reported that the chaw rooms were being robbed of bunches of these tooth picks and it was evident that the boys, in their nervous, worrying moments, went about prodding their teeth, chewing the wood and bothering the gums and teeth incessantly.

In my next address to the encampment, I cautioned against this too prevalent use of the tooth pick and stated that the wooden tooth pick would be eliminated from the camp and that every Jackie would be provided with the smooth polished French goose quill.

That no sailor boy would be expected to pick his teeth more than two minutes after meals, or "chaw," as it is known in the Navy.

I also instituted the daily mouth wash, using Lavoris basis for one week, then followed up with Listerine, then Glycothymoline and Borine, as mouth cleansers and mild disinfectants. The reason for this change was so as not to cause monotony or assure against the organs of taste as well as the tissues growing tired of the same daily wash. In about one month, these gum irritations, inflammations and pains had subsided and a variety of infections thereby prevented.

In another address, I admonished them against picking the teeth to the extent of causing the gums to bleed. Be extremely kind to your teeth and gums. No tooth can long remain in health and resist pressure unless its foundation is in rigid and

not boggy condition, and permit me to render this compliment to the Jackies,—they have lived up to these teachings cheerfully, and if you wish to see clean teeth and well kept gums, I will gladly give you a pass, to inspect these mouths.

Again, I learned that some boys had tender, thin and delicate mucous membranes, and the tooth brush was used too often, and I advised the use of the dental napkin and tooth powder, one-half of cleaning, the other half use of tooth brush and paste; or in other words, they were employed alternately. This, in four or five weeks, corrected that bleeding and tender circumstance.

The Canadian Dental Surgeons learned that greater oral mischief came from tartar than from so-called saucer cavities. In other words, a cavity in a tooth whose pulp was still alive was not as great a menace as accumulation of tartar, because beneath that calcic formation, there was a most favorable harbor for bacterial growth because of the contact with the immediate circulation and the ease with which oxygen and other supporting elements were had, which were more favorable to the life of the low form of germs. Hence, all the mouths of the Jackies were especially examined to ascertain the presence in the slightest extent of calcic formation; for, as this foreign matter accumulates, the gums retreat.

In connection with the statement that some of the boys believed that they had pyorrhea alveolaris, permit me to make the statement that the examining boards would have saved for the U. S. Army and Navy thousands of recruits if all dental examinations had been left to competent dentists. Thousands were "turned down" who wished to go because the examining physician pronounced cases pyorrhea alveolaris, but were slight alveolitis. Dr. Costello, my superior Staff Officer, is one of the most efficient medical men, possessed of a keen judgment on dental and oral conditions. He stated to me that fully 25 per cent of the boys rejected could, with small cost, be placed on the reclaimed list, if the right kind of a dentist had them in charge. Dr. Costello has been for years a Naval enlistment or recruiting officer, and he related to me that lack of dental knowledge and indifference to spending a few dollars on the teeth, has caused this nation to go from a volunteer spirit to that

necessary factor, the draft, and the man who wanted to fight has, because of inattention to his teeth and mouth, been rejected. It is now our part and duty to correct this national error. Our patriotism must rise above the selfish spirit of serving ourselves. We must assume the character of patriots.

MAKING YOUR MONEY EARN MONEY—SAFELY.

A SERIES OF ARTICLES ON THE CONSERVATION AND INCREASE OF SAVINGS.

BY GEORGE LEE McCANDLESS, CHICAGO, ILL.

ARTICLE IV. BONDS IN WAR TIME.

Previous articles have discussed the borrowings of corporations. From time to time governments also find it desirable to borrow for various purposes—for public improvements; for waging war. Government bonds, having back of them the combined wealth and resources of a nation of people having a reputation of honor and integrity, generally command first place in the market of securities.

However, when such a government issues bonds for war purposes, money ordinarily engaged in natural commercial pursuits is reluctantly diverted to this other purpose. The deciding factor in so diverting this money, aside from patriotic or sentimental stimulus, is interest return.

Thus when Great Britain and France borrowed their first war money here three years ago, an interest rate of 5 per cent was established and the bonds—Anglo-French bonds—were sold at less than par. Naturally they sold in a hurry. Here was perhaps the strongest security ever offered up to that time at such an attractive rate of interest. Furthermore, in order for this issue to be a thorough success, these bonds were made convertible, at the holder's option, into longer time $4\frac{1}{2}$ per cent bonds.

The following table will serve to illustrate the comparative status of bonds in time of war and peace and also to indicate the probable advantage of the conversion feature of the Anglo-French bonds:

	Price— Year Before	During War	Year After
Napoleonic Wars, 1793-1815—			
British, 3% bonds.....	97	47	66
French, 5% bonds.....	71	7	57
Boer War, 1899-1902—			
British, 2¾% bonds.....	114	82	93
Russo-Japanese War, 1904-1905—			
Russian, 4% bonds.....	99	78	87
Japanese, 5% bonds.....	100	89	102½
U. S. Civil War, 1861-1865—			
U. S. Government, 6% bonds.....	100	83	114¾

So now we find history merely repeating itself. Two years ago U. S. Government 4% bonds were selling around 112. Now the last issue of U. S. Liberty 4s is selling below par and it is anticipated that the next issue will bear 4½% interest. Obviously the opportunity to make money on the world's premier securities is to buy them while the borrowing countries are at war. It is only reasonable to expect history to repeat itself again. When peace comes, made more secure than ever before, our Liberty bonds will certainly sell at high prices consistent with usual precedent. Therefore, we are now presented with the unique experience of proving our patriotism and at the same time making an investment bound to show a handsome profit.

A large buyer of securities was once asked how it was that he nearly always made money on the things he bought. He answered, "Oh, I am a philanthropist—I give the people what they want. When they want to sell, I buy from them and when they want to buy, I sell them what they want." And so it is that in uncertain times it is easier to buy than to sell. This is true of everything in general and investment bonds in particular.

If a man has any confidence in the future of this great country of ours, he knows that 5% money will some day return. He also knows that then high grade bonds will sell around a 5% basis or better. So the man who can now buy these bonds on a 6 to 8% basis would seem to be a wise man.

A list of such bonds is presented below. The writer believes that all these bonds are absolutely good, that the interest will unquestionably be paid promptly as it becomes due and that principal will be paid at par, or better, by maturity.

BONDS	Present Market	Yield to Maturity
Central Argentine Ry., 6s.....	78	9 %
Interboro Rapid Transit, 5s.....	83	6.6%
St. L.-San Fran. R. R., 5s.....	70	8.5%
Midvale Steel, 5s.....	85	7 %
U. S. Rubber Co., 5s.....	78	7 %
U. S. Smelting, 6s.....	97	6.5%
Montana Power Co., 5s.....	89	5.8%

All but the first named, listed on New York Stock Exchange. Prices quoted as at the time of the writing of this article.

The opportunities of the present situation are such that stocks and speculative or semi-speculative investments need not be considered even though a high yield on your money is required. Why take a risk, when good bonds paying a fair interest return are selling at levels that mean good profits when the war is over?

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held at the LaSalle Hotel, January 26, 1918, with the President, DR. P. B. D. IDLER, in the Chair.

Dr. Edward T. Tinker, of Minneapolis, Minnesota, gave a lantern slide talk on "Attachments to Vital Teeth."

DISCUSSION.

DR. MARCUS L. WARD, Ann Arbor, Michigan:

Mr. President and Members of the Chicago Dental Society: I did not know in advance the manner of presentation of this subject tonight, and will have to apologize somewhat for the disconnected way in which I shall discuss it. I knew, in a general way, what Dr. Tinker has done in a couple of other places and I attempted to guess the nature of his presentation tonight. I have a few slides to show, but before doing so I want to speak of the general subject of attachments on vital pulps. Along about 1910, 1911, 1912 and 1913, our dental journals were filled with writings of crown and bridge workers in this country. About everyone of them who had any reputation as a bridge-

worker is on record as having settled in his own mind at that time that pulps should be removed in the majority of cases if we were going to construct a bridge, and not allow the pulp of a tooth to interfere with the construction of the bridge. That condition existed pretty generally throughout the country until two or three years ago.

At this time it was proven more definitely than it ever had been before, that many systemic troubles could be traced directly to infected root canals. This caused the men in many sections of this country to question the judgment of those who were devitalizing teeth for crowns when used either alone or as abutment for bridges. In other sections of this country, particularly in the vicinity of New York, the practice of devitalization has been continued with an effort to improve in a very marked degree root canal work that had been done previously. Obviously, there are two interpretations being placed today upon the dentist's duty in regard to the question of devitalization in connection with bridge work. One group is saying, "Keep the pulps of teeth alive," and the other one, "Do better root canal work." As I have studied the character of the men in these two groups, I am of the opinion that those who do not allow the pulp of the tooth to govern the character of the bridge that is placed, are getting by far better results, and those who are building what they can around live pulps of teeth, are doing a comparatively temporary kind of bridge work.

There is no one who places more importance upon the value of the pulp in maintaining strength of tooth structure than I do. In fact, I have on several occasions made the statement in connection with discussion of cavity preparation for gold inlay, that the operator, to be successful, must make greater extensions for pulpless teeth than for vital ones wherever much stress was likely to be applied. I have studied the effects of loss of inorganic matter through death of the pulp in the laboratory, and I am convinced thoroughly that a vital tooth is much stronger than the pulpless one whenever its occlusal or incisal portions are to be subjected to stress. Regardless of this feeling, however, I am unwilling to counterbalance the value to the patient of the pulps of two or three teeth with the value of a necessary bridge.

The fact that many of our earlier operators placed so much

importance upon the pulps of teeth kept them from developing a skill and judgment in bridge work that they could otherwise have done if they had been willing to sacrifice a pulp once in a while which they knew to be in the way of construction of the kind of bridge which should be constructed. The interpretation that I have placed upon my duty as a teacher in Crown and Bridge work, in view of the recent findings relative to infected root canals, has been largely as follows:

First, I have cut down the number of teeth that I have devitalized for bridge abutment because I have developed a technic for the construction of compound gold inlays that will take the place of crowns formerly applied which necessitated devitalization. I have not, however, as you will see from the slides which follow, carried the application of the gold inlay to the extent that the essayist has, nor do I intend to in the near future. He seems to imply that the majority, if not nearly all of his work, is done with the inlay or 3/4 crown on teeth with vital pulps. As I go over the lantern slides you will note that I am very enthusiastic about placing bridges and retaining the pulps alive in some instances, but do not hesitate to remove the pulp for the construction of certain bridges in certain other cases. You will note that I am enthusiastic about the inlay bridge, the fixed bridge with crowns as abutments in others, and the removable bridge in still others. In fact, I believe that the one who does the best service in bridge work today is the one who does not confine his efforts to any one particular type of bridge work, or to any given policy regarding devitalization.

DR. HART J. GOSLEE:

I have enjoyed the presentation of this paper by Dr. Tinker very much indeed, and have likewise enjoyed the discussion by Dr. Ward. To be real frank, candid and honest with you, the latter was to me more interesting, because of the fact that Dr. Tinker presented only a series of typical ideal cases. How simple it would be for all of us, and how much easier our paths would be, if even a majority of our cases were as ideal as those which have been presented to us by Dr. Tinker?

I am quite willing to concede that in selected cases, such as those that have been presented tonight, and with the skill that Dr. Tinker has to apply, the principles and technique involved,

such idealistic methods are unquestionably successful. But I want to call your attention to this fact (and I will ask you if you do not agree with me after seeing the series of cases that were presented to you by Dr. Ward), whether they are not more like the average cases that come to us in our every day practice? I am sure they were, and I have often said, and repeat it again, that there is no one general line of procedure which is or perhaps ever will be universally applicable. In the light of modern procedures, it is now more than ever essentially necessary that we should strive to conserve the pulp in every and any tooth upon which we are called to operate, whether it be for a filling, or for an attachment for a crown or a bridge. I do not believe that any one of us here ever ruthlessly, wilfully or maliciously sacrificed the normal pulp of a good tooth, and cannot conceive that any one could be guilty of such a crime. It is true, no doubt, that many of us sacrifice pulps which might perhaps by some other means or method have been saved, but all we can be guided by is our judgment in the case. I am saving or trying to save the pulps of teeth, and am conserving just as many pulps today as I always did. In this connection it was always my ambition to save every pulp that I thought it was possible to save, and yet get a maximum of usefulness from the tooth.

I hope you will permit me to refer briefly to the views which I have expressed upon this subject of pulp devitalization with regard to the application of artificial crowns, whether they are to be used as an individual means of restoring a single tooth, or whether they are to be used as a means of anchorage for fixed bridge work, or for bridge work of a removable character.

Some 18 years ago—I am going back that far to make a single point—I observed that it was the general practice for dentists to place gold shell crowns upon teeth with vital pulps. At that time I had the opportunity for large clinical observation; and to see a great many teeth which carried gold crowns. I also had an opportunity to apply a considerable number of gold crowns, perhaps more than the average operator in the average practice at that time, because of my college connection. I also had the opportunity of observing that there was invariably some pronounced evidence of gingivitis and cervical irritation around the necks of most all teeth which carried artificial crowns, and par-

ticularly gold crowns on molar teeth. At that time the teaching was to grind down a little from the buccal, lingual, mesial and distal surfaces, and around the four angles, and then to take a little off from the occlusal surface, and this was the practice. Young as I might have been 18 years ago, I came before the Chicago Dental Society and read a paper in which I advocated that the pulps of teeth which were to be prepared for the reception of gold crowns should almost invariably be devitalized, with certain exceptions duly noted. I want to say now that I did not mean at that time that this procedure should be followed because it was easier to do it that way, or because of the fact that the pulp had no physiological value whatever, or because a tooth with a dead pulp in it would be better than a tooth with a live pulp in it. Not at all. But what occasioned my remarks and caused me to take the stand I took was this: it had been my observation that it was quite—if not, indeed, almost—impossible for me to give to a tooth, a typical molar tooth, for example, the necessary mechanical preparation which would permit me, or make it *possible* for me to properly and more or less accurately fit that tooth with a telescoping band if it had a vital pulp in it. Hence, I took the stand that, since irritation of a mechanical nature must result if the band did not fit, and since it was absolutely necessary, therefore, to make the band fit, that in order to have a band which did fit if it became necessary for mechanical reasons to devitalize the pulp in order to enable me to do it, that is what should be done, and I am still of the same opinion today. Of course, we should conserve the vitality of the pulp of every tooth whenever and wherever it is possible, but I will also submit that if we need to use that tooth, and if that tooth demands restoration, and then if *adaptation* is one of the requirements of success and permanency in the restoration, whatever may be the type of restoration used, and if in turn it is necessary to devitalize the pulp in order to effect and obtain that adaptation, then to do it rather than to leave the pulp alive at the expense of correct adaptation is the better practice. This has to do with the absolute mechanical requirements of peripheral adaptation in the preparation of teeth for the reception of gold shell crowns.

I now want to ask you this question: If it is thus practically impossible to prepare a typical tooth for the reception of a

gold shell crown such as we now make, when the tooth has a vital pulp in it, is it possible to give to teeth such further peripheral preparation as the shoulder crown demands, and still conserve the pulp? That the shoulder crown is a beautiful form of mechanical adaptation there is no question. Its application affords a means of obtaining a continuity between the artificial restoration and the supporting root, and, as that continuity may be made more or less perfect, in that same proportion will the degree of irritation become less and less. If it is true that it is usually quite impossible to prepare a vital tooth for the reception of a telescoping band which fits over the outside of it, then how can we cut enough more to form a shoulder and thus obtain a more perfect continuity in the adaptation of the crown to the root? It is possible that in Minneapolis, under ideal conditions, this may be done, but, generally speaking, I have not been able to do it, and I do not believe the conditions are any different today than they have been at any time since I have been in the practice of dentistry. We all want to save the pulps of teeth if we can. It is our duty to do so. Nobody, I think, in this audience would question but what a tooth with a vital pulp in it is a better tooth than a tooth with a dead pulp in it; but if it becomes a question of whether we can utilize a tooth with a dead pulp in it to better advantage than we can by conserving its vitality, which of the two routes should we take? Our signal ambition in the decision which we must make should be the degree of permanency, usefulness and comfort which will obtain, and this will always be a question largely, if not entirely, of judgment on our part, and judgment can only come from experience.

I wish it might be possible for all of us to possess Dr. Tinker's skill and ability to make these complicated preparations such as his pictures have shown, and which, I am sure, he can do, on all teeth as they present to him. I am frequently able to do it where a tooth stands alone without adjacent teeth on one or both sides of it, but when you get molar teeth which have adjacent teeth in contact with them and try to make those beautiful preparations, and form those beautiful shoulders, you will find it more difficult than Dr. Tinker would have you think. You may be able to do this more extensive preparation without

great mechanical shock to the pulp in cases where the age of the patient is so advanced as to be favorable, or perhaps where there may be a secondary deposit of dentine, but only where you can do it in such cases, and under such conditions as will insure the beautiful adaptation to which he referred, do I believe it to be a more ideal operation than that which we are performing today in the usual manner. If you cannot do this with reasonable facility, and certainty, then use that method which will enable you to obtain the best results possible at your hands. This is the sacred duty of all of us.

One other thought: I am sorry that Dr. Tinker has not yet come to the use of replaceable teeth. These porcelain root restorations of his look very nice in pictures, but I would very much question the practice of soldering porcelain facings or teeth of any kind to a fixed structure, in view of the better methods which we have at present.

DR. F. E. ROACH:

I feel a little disposed to defend Dr. Tinker. I regret that he did not explain his position so that we might better understand him. I have had occasion to see considerable of the work of Dr. Tinker, and I know that he does the things that he claims to do, and I am sorry that he did not say that this beautiful and idealistic method was not universally applicable or more nearly universally applicable than it is in reality. I regret, Dr. Tinker, that you did not state that in your opening remarks, so that possibly we would have understood your position better.

I quite agree with Dr. Goslee and Dr. Ward that this method of procedure is a most difficult one—one that has tried most of us as operators, and one that has tried the endurance and pocket-books of many of our patients. These are things which we must of necessity take into consideration in all of our work.

I think Dr. Ward was a little unfair. I believe he made the other side of the picture a little too severe. I believe he picked out some of those abominable neglected cases that we get in our college clinics. We do not get, Dr. Ward, in our practices, in my experience, so very many of these cases that you showed.

DR. WARD:

What would you teach your students?

DR. ROACH:

I would teach my boys in most of these cases to make removable bridge work. That is what I am teaching them. I may be leading them astray, but that is what I am teaching them, and I realize in appearing before you in a discussion of this paper that what I may say, or really feel that I should say, is that in most of this work which these gentlemen have presented to you, in most of these cases where those teeth adjacent to these spaces are good sound teeth, they had better be made of a removable type and conserve not only the pulp itself but the tooth in its entirety. If you are going to practice and teach conservatism, go the limit, and conserve not only the pulp but the whole tooth and, ladies and gentlemen, I am in earnest. I am in earnest about the question of utilization of removable appliances for a great majority of these cases. I know that it can be accomplished. I know that these appliances can be made so that they are useful and comfortable, and I will take my chances on the destructive tendencies that they may have upon the natural teeth. We must use the appliances intelligently; we should acquire a broader understanding of their construction and application and their care. Instruct your patients to take care of these appliances in order to avoid possible decay around them. That is all entirely feasible and practicable and simple as compared to many of the appliances that are being used in a fixed way. That is my position with reference to many of these cases.

Dr. Tinker is reasonable about these things, I know. I know he does not treat all of his cases in this way. He is probably overbalanced in this procedure as I am overbalanced with regard to removable appliances; but he is getting results in his practice, and I know he is. He has spent the time to master the technic of the work, and he carries out the technic according to his understanding, and as a result he has success with it. We all have our natural inclinations, and we work along the lines of our own personal abilities; then, if we are not successful enough to do these cases as Dr. Tinker does them, then we should try and do them in the simple way like some of the rest of us do. (Laughter.) I believe the time is coming—in fact, I think it is already here—when the profession is going to give more attention to removable appliances, and thereby conserve these beauti-

ful natural organs as God gave them to us and take a chance on the result. Suppose decay does occur around some of them—can we not fill or crown when this becomes necessary? We will then have less cutting to do, the microbes of decay will have done some of it for us. But under proper care this does not occur.

DR. G. WALTER DITTMAR:

I enjoyed Dr. Tinker's paper. He presented it excellently. Some of his illustrations, however, do not tally with his preliminary remarks. They do not show what he intended they should show; he, however, explained some of these discrepancies.

Dr. Tinker took up the subject of attachments to vital teeth, and I think intended to show us principles more than anything else. In fact, his whole argument and the illustrations were along certain lines of principles. What convinced me that Dr. Tinker must be a very exceptional workman were the "X-ray" slides. The fit of those inlays was remarkable, especially where two or more were united, as the illustrations showed. He has ability away above the average, away beyond anything I possess. I would not attempt, unless the teeth were somewhat loose, or in most ideal position, to do what he has done and shown here, because I know I would not get good results.

Another thing the radiographs showed was that his method of restoration must be good, for in the many cases he has taken radiographs of recently—some 82, I think he said—there were only two pulps that were affected. There were no abscesses. So far as that procedure goes (i. e., attachment to vital teeth), in his hands, we cannot criticize it.

I enjoyed the paper, and I think we will all get something from it, but just as Drs. Goslee, Ward and Roach have said, I think we cannot use the method very generally, for two reasons: First of all, we have not a great many conditions where we can really use it to the best advantage; secondly, the average dentist has no business to attempt that kind of dentistry. If the average man attempted it, he would make a failure, and unless a man is exceptionally skillful, he ought not to attempt it, in my opinion. I tell my students that, as a rule, if we are going to make an inlay bridge, to use an inlay at one end of the bridge only, for it is necessary to get that inlay home right. Whenever we use

two or three inlays the chances are that one or all of them will not be in proper position when the bridge is cemented. Of course, that does not hold true all the time, but it does in the hands of the average student and in the hands of the average practitioner. A man must be an exceptional workman for all of them to fit. Men like Dr. Tinker and Dr. Roach can do this. I have seen multiple inlay bridges put in by Dr. Roach that were beautifully seated, but once in a while he, like others, may have an accident. As a rule, each inlay is not perfectly seated when you have two or three in one bridge, unless the teeth are loose enough to yield some. That brings to my mind one or two things I am going to discuss regarding Dr. Tinker's technic.

If you remember, he brought out the point that the grooves in the mesial and distal surfaces which run from incisal or occlusal to gingival should be practically parallel, in every way; that is, when the inlay starts to position, there should be frictional contact, at once, so that the rods or ridges in the cavity side of the inlay or three-quarter crown, will fit into the grooves of the cavity all the way to the gingival seat. As a mechanical principle that is fine, but it is almost impossible to obtain when two or more inlays or three-quarter crowns are united *in a bridge* and get them all to place properly, on even the most suitable case for such technique.

A word about the shoulder crown. I shall be glad to have Dr. Tinker tell us what he really means by the shoulder crown. If I understood his definition right, it is not a shoulder crown. It is about the kind of crown I have been making for years. I have always felt and always taught that it is necessary to remove the bulbous portion of the tooth to get the gingival part to fit right. I don't want a shoulder when I cut down the gingival portion. I try to avoid shoulders, if possible, and when I get the band trimmed down right it fits as close as any shoulder crown can fit. I put on gold crowns that produced very little irritation, no more than polished gold will produce; but these crowns do not all fit over vital pulps. I cannot prepare the average normal shaped first molar, either upper or lower, with a vital pulp and make a shell crown fit right around the gingival portion. I cannot do that with an upper 1st bicuspid or lower 2nd bicuspid. Of course, we do not usually like to put gold crowns on bicuspids,

because of the show of gold. We can do it with the second or third molars sometimes. So I am taking the same position that Dr. Goslee took. I think he made the right statement. We do not want to abandon entirely the banded gold crown, one that is properly made and properly contoured, especially for bridge work. I would not give a cent for an entire cast crown for a bridge anchor, unless it was very thick and heavy.

There is another very important thing we should take into consideration when we make crowns, and that is, the occlusion and articulation, and every crown I make I make right direct with the patient present. I do not want the use of any anatomical articulator. I simply want the patient. I fit the band as well as I can, and then I take the bite with casting wax in and over the band. I need not only occlusion but articulation, every movement the patient can make while masticating. I add sufficient wax to the band to obtain contour, contact and alignment, if possible, then invest and cast in gold. I "failed to connect" in Dr. Tinker's description of his technique for making cast crowns. I do not know how he gets the contour. I do not know how he gets contact other than by guesswork. I wish Doctor Tinker would describe his technique further. I like to make the band, contour it and fit it with as nearly perfect contact as possible, and then with the patient present I get occlusion and articulation and contact and alignment. I get something that harmonizes in form and in every other way with the neighboring teeth. I have something built for that particular space, not on an articulator, but according to the articulation the patient registers. I have something that is going to work right according to the movements of the jaw. I have something that will not be likely to produce pyorrhea, because a great deal of the pyorrhea that is produced is not from gingival irritation at all, not by any means. I venture to say, half of the pyorrhea is produced by the overstraining or overworking of the teeth. Many a crown that fits beautifully at the gingival part and many a beautiful, clean, and otherwise perfect tooth has pyorrhea due to overstrain. Many a bridge produced pyorrhea, not because the crowns did not fit right, but because there was overstrain, frequently produced by malocclusion. That has caused many bridges to be lost, as you all know, so that is another phase of the proposition

we have to be careful about.

Dr. Ward presented an interesting discussion from an entirely different viewpoint. When Dr. Ward was speaking, I remarked to Dr. Buckley, "nonsense." Dr. Buckley said, "Get up and tell him that." I acknowledge that I said it and it was regarding only one of the illustrations, which showed two bicuspid with the molars missing. He showed an illustration of a lower case where the teeth distal to the bicuspid were missing, and Dr. Ward said he would devitalize the pulp and put a Peeso attachment to that tooth, and I made the remark, "Nonsense." I feel that way about it. I would not destroy the pulp in that nice bicuspid, which it appeared to be. I would not attach to it in that way at all. I would use Dr. Roach's method of attachment and not destroy the pulp, and the tooth; make an attachment sufficiently strong to hold it and be simpler and better in every respect, by using mesio-distal grip clasps.

As to the mesio-distal grip clasp, it is made of round wire, using No. 18, 17 or 16 gauge, Weinstein's formula, elastic gold wire. The important thing is to make a clasp or clasps which will grasp the tooth or teeth in a way to hold the appliance in position, which can be done by applying one or more clasps of this kind to the natural teeth.

DR. A. E. SCHNEIDER:

Psychologically, Dr. Tinker, you need support, but technically you do not. However, I am going to try and give you the support your work merits.

While the Doctor was reading his paper I thought of the advice given by our school professors. I was also thinking if the X-ray and its story, of the numerous specialties in dentistry, and also of the judgment of our professors asked us to exercise in these cases, and I wondered whether somebody was not missing something. I cannot imagine anything in better condition to work upon than a healthy tooth. A pulpless tooth is not what we might term a healthy tooth. It can be made *tolerable* under certain extreme prophylactic conditions.

In the matter of judgment in these cases it is absolutely necessary, first, that we have an X-ray of the entire mouth, then note whether one bicuspid drops down and the molar jumps up in the bite, in fact all the various conditions we will have to

deal with. We know that one man cannot do every type of work that comes into the office, successfully, because each particular type of work demands judgment of an extreme type.

When I see these abnormal cases that Dr. Ward was showing us on the screen, I wondered what they were doing with their orthodontists. There are conditions where those teeth, with a little judgment, could have been depressed and placed back into normal occlusion. But it takes time and effort on the part of the operator to do it, but it can be done and should.

Are we working towards ideals or trying to fill the shoes of the average man? I have had this average man business bored into my intelligence at every dental meeting until I fairly want to shout my objection, and it seems to me we should drop it. As teachers we should speak of ideals. Ideals we know can be lived up to. The average man must grow. If you do not hold up the ideals, how can the average man get out of the rut?

The gold shell crown will irritate, and the fact has been admitted by Dr. Dittmar that it will irritate "a little." Yes, and again a little, and that little step by step means what? That little thing grows and spreads just like a fire, and eventuates into what? Pyorrhea. And that is our hardest battle these days. I believe that 90 per cent of our pyorrhea today is caused by immature dental operations. Our efforts demand greater attention. The people demand skilled work, and consequently we must grow up to our ideals and not stick in the rut.

There may be inlays formed which of themselves, so far as the casting *per se* is concerned, will not hold, but Dr. Carpenter has shown us a way by which we make them hold by accessory pin attachments after the inlay is set, and I believe they will come in very useful in the type of case where the occluso-gingival dimension is very short.

As to stripping the tooth of enamel, if you will take any pulpless tooth, place it in a flame carefully denuding it of its enamel you will begin to more fully realize the form of the dentin underneath. I had a number of them in the clinic today and there is not a case where that enamel, when chipped off will undercut the dentin. There is not one case, upper or lower, consequently, if we take the enamel off the teeth we will find

the least amount of destruction of that tooth and ample room for the replacement of any work we wish to put on.

Can you picture, then, how very little destruction is actually necessary in most of these shoulder preparations?

I adjure you, in the interest of the future prophylactic dentistry not to miss the opportunity Dr. Tinker offers to get in line with our best operators who are all doing inset dental operations exclusively.

DR. ARTHUR D. BLACK:

As I read the program the title of Dr. Tinker's paper was "Attachments to Vital Teeth," and not removable bridges, or any of the other subjects that have been discussed. Many of Dr. Ward's beautiful pictures were not properly a part of this discussion at all, because they portrayed cases in which this type of appliance is not indicated.

Dr. Tinker has given us the technic and application of this type of attachment to vital teeth, and I take it from the discussion that it has been presumed that this is the only way in which Dr. Tinker ever constructs a piece of bridge work, which I think is not a fair conclusion to draw. It is to be regretted, however, that Dr. Tinker did not describe the type of cases to which he applies these methods. He has shown us a series of radiographs which were, I am sure, the envy of all of us, because of the beautiful mechanical work portrayed.

The real reason for the development of this plan of bridge construction is the conservation of the pulp. It is therefore proper and of vital importance that we study the effect of the amount of cutting required upon the pulps of the teeth to which these bridges are attached.

The question of pulp irritation is one which should have serious study. In a case presenting with abrasion of the teeth, in which there happens to be a tooth which does not occlude with the teeth of the opposite arch, on account of the loss of one or more of the opposing teeth, there will be found the same changes in the pulp chamber of the unabraded tooth as have occurred in those showing abrasion. This demonstrates that the building of secondary dentin within the pulp chamber is a reflex activity, and we have a right to reason from this and from observation of cases that irritations which will cause the building

of secondary dentin within one or more teeth of the denture will cause similar changes in all of the teeth of the individual. Therefore, the irritation caused by the excessive cutting of teeth for some of the attachments shown, may result in serious changes in all of the teeth of the mouth. These changes eventually result in the death of the dentinal fibrils, the dentin becomes softer and the attachment of the enamel to the dentin less secure, so that it breaks away easily. Finally the pulp will often die, and alveolar abscess may develop.

In the last analysis, therefore, we are often to decide in favor of attaching a bridge to a vital tooth, or of removing the pulp, upon our judgment as to which procedure presents the least danger of alveolar abscess; this is a more important consideration than the security of the attachment.

In this connection it may not be too far afield to refer to some recent studies which I have made as to the frequency of the occurrence of alveolar abscess following root canal fillings. A series of three thousand radiographs, taken for patients presenting at Northwestern University Dental School, showed 851 teeth with root fillings. These were taken as patients presented, and the facts to be stated have no relation to the operations of our students. There is no record as to who filled these root canals. I have tabulated these root canal fillings, placing them in two groups; those which would be considered good root canal fillings, and those which would be considered poor root canal fillings, using my best judgment in interpreting the radiographs, and those which were apparently good root canal fillings, show but 8 per cent of abscesses, while those which were classed as poor root canal fillings, showed 65 per cent of abscesses. Doubtless some of the 8 per cent were abscessed before the root canals were filled, and as many of the operations were performed a number of years ago, before careful technic in root filling was considered as of much importance, it seems fair to state that careful and conscientious operators may approach the procedure of pulp removal for bridge work with the assurance that a very high percentage of cases will not menace the health of their patients by abscess formation.

DR. JOHN P. BUCKLEY:

I rise simply to correct one impression that has been made on

this audience, but before doing so I want to compliment and congratulate Dr. Tinker on his able paper and the splendid manner in which he has discussed this subject; and while Dr. Arthur Black was right in calling attention to the fact that nearly all of the speakers had wandered far away from the subject, before Dr. Black got through he was telling you how to fill the canals of teeth. (Laughter.)

I want to correct the statement made by Dr. Schneider that 90 per cent of the pyorrhea found in the mouths of our patients is caused by dentists. As a man who has devoted most of his practice to the treatment of this disease, I want to say that 90 per cent of the teeth lost by pyorrhea are those on which no dentist has worked, not even put small fillings in the teeth. (Applause.) I would not want the laity or the average layman or the public press to get hold of that statement, that 90 per cent of the pyorrhea existing in the mouths of patients today is caused by the dental profession. It is not. I think the statement is more nearly correct that 90 per cent of teeth diseased are teeth on which no dentist has worked, no crowns, no bridge attachments, and scarcely any fillings in the teeth, all of which is a regrettable fact.

DR. MARCUS B. WARD, Ann Arbor, Michigan :

I want to correct one impression that was left by the remarks of Dr. Arthur Black. He did not understand what I tried to convey. Most of those slides were presented to show what should not be done. There were 11 cases out of 18 in which I advocated bridges.

One word in regard to the statement made by Dr. Dittmar in which he used the word "nonsense." I do not mind any statement that I may make being referred to as nonsensical, because I have been called a lot of worse names than that. (Laughter.) But over in Detroit, we have waked up to one thing seriously, and I am going to say that I believe Chicago needs the same thing, and that is the practitioners there are adopting more and more removable bridge work. In New York more and more of the big men there are favoring removable bridge work. There are two or three attachments that were shown in New York during the meeting of the National Dental Association that most of you should be familiar with. Eight or ten of the best men down there are using Peeso attachments and other attachments. We have 6 boys who have started to do that kind of

work because we have not a single man in the City of Detroit today who can do it.

DR. F. E. ROACH :

I want to ask Dr. Ward to tell me what per cent of the cases that present in the practices of the dental profession generally can be met with the Peeso, Ash's, and other types of removable attachments that the New York men are using?

DR. WARD :

Ten per cent.

DR. ROACH :

Ten per cent is a liberal estimate. What are you going to do with the other 90 per cent? In order to deal with this 10 per cent and follow the practice as indicated and as followed by these men, what do you do? You ruthlessly, indiscriminately and almost criminally cut off these pulps. That is my position in regard to this matter.

W. D. N. MOORE :

I have been very much interested in the presentation of Dr. Tinker's paper and in the discussion of it. His work that I have seen has stimulated this interest I expect. This is a subject of great importance to us, especially at this time, and this paper should make us endeavor more and more to conserve live pulps when possible. The paper has been discussed from many viewpoints and while I do not wish to prolong the discussion I do wish to say it is impossible to use any one form of attachment exclusively in bridge work. We must regard bridgework as we would any other one practice in dentistry. One attachment will meet the requirements of one case and fail in another. The slides shown have proven this variance. The cases shown by Dr. Tinker were suitable for his type of attachment. On the other hand those shown by Dr. Ward would demand a different form of attachment.

In reference to removable bridge work, this means of supplying lost teeth has not been without its failures. As much injury has followed this method as has accompanied fixed work.

I am glad to hear Dr. Buckley correct the statement made regarding the cause for 90 per cent of the pyorrhea found in the mouths of patients and to call our attention to the fact that the vast majority of the cases of pyorrhea is found about teeth on

which no dental work has been done. Dr. Dittmar said a great deal of pyorrhea was produced by too much stress on teeth, and yet we must not forget a great deal is caused by not sufficient stress. The "straight and narrow path" is definitely drawn in this work.

It is a good thing to have papers read where the extreme is proclaimed; because it sets us to thinking. One gentleman has said that this technic cannot be carried out. I would not say that because it has been my observation that when one is determined and persevering in accomplishing a certain detail he usually succeeds. He will do things that the other fellows term impossible. Dr. Tinker's technic in many cases and on certain teeth would be applicable. It remains for us to carefully discriminate.

DR. TINKER (closing):

I have been grossly misunderstood and have been handled to beat the band. To put myself right I would like to make a few statements.

It is very evident that Dr. Goslee, Dr. Ward and others did not pay strict attention to what I said. In my opening remarks I stated that I was not here to discuss removable bridgework or inlay attachments, that my paper was on the subject of "Attachments to Vital Teeth" for fixed crown and bridge work, and I think I have adhered strictly to the subject.

One cannot cover the whole phase of bridge work or attachments in one evening. I had about 11 illustrations in connection with my remarks, which I thought would be plenty for one time.

From the statements of Drs. Goslee and Ward, one would naturally infer that I picked only the favorable cases from my experience and neglected to bring the others. I wish to say that I went through my records and as I would come to a case where I had used attachments on vital teeth, I took that case, called in the patient, had them radiographed and from the radiograph a slide made. These slides you have seen on the screen tonight—slides taken as the cases came and not picked for exhibition.

Percentages are the only things we have to go on. When a surgeon says he has a certain percentage of failures or suc-

cesses he is governed very largely as to whether or not he will continue a certain operation. The same is also true in dentistry.

Just a word in closing, with regard to one's ability to do this work. I went down to St. Louis and gave this talk and Dr. Summa, connected with the Iowa University, came to me with the same feeling and said, "Doctor, it cannot be done." And my reply was, "There are dozens of men who are doing it all the time."

There are men who have followed my teaching who are doing this work beautifully. Dr. Summa said if I would come to Iowa City and teach the boys how to do it he would be delighted. I started in two years ago, took demonstrators and gave them a course at Iowa City. I took sections of the senior class, and these boys are today doing creditable operations. The same work is being done in the University of Minnesota. Dr. Maves and others are doing it successfully and it can be done by men in Chicago. Men in Minnesota are no different from what they are here. They are the same the world over, and it is simply a question of development of technic; that is all you can call it. You can do it if you make up your mind to it. If you can make a good M. O. D. inlay you can make a three-quarter crown.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held January 2, 1918, with the President, Dr. J. H. WOOLLEY, in the Chair.

Dr. Joseph C. Beck gave a talk on the "Past, Present and Future of Plastic Surgery About the Head and Neck."

DISCUSSION.

DR. J. G. REID:

My reputation as a plastic surgeon is not very great; in fact, I have had nothing to do with it, but when we consider the possibilities of future plastic surgery as outlined by Dr. Beck, it really would surprise one not familiar with the subject.

I have never forgotten the very valuable information that the entertainer of this evening presented to this society a few years ago. His paper at that time was a valuable and lasting contribution to dental literature, and then to compare it with

this one with which we are unfamiliar, one can see a vast difference in the presentation of the two subjects. It is a very broad subject and its future possibility, from the work that is now being done in plastic surgery, would lead me to at least say "Excelsior." Probably in the next decade or two we will still find greater improvement, but taking the knowledge given us by the doctor we are only in the infancy of plastic surgery. It remains yet to be developed and perfected. The field of plastic surgery will be materially broadened, and the opportunities naturally, of course, will be presented in this terrible war for the development of the tastes of the plastic surgeons, and their work will be a wonderful addition to our information on this interesting subject.

I have been very much pleased and edified by Dr. Beck's remarks; I am glad to have had the opportunity of seeing these pictures and of knowing what is being done in this line by men who are interested in oral and facial surgery.

DR. F. E. ROACH:

It is hardly to be expected that we as dentists should discuss a paper of this nature very extensively or very intelligently, and it is quite impossible that we will be able to add anything of particular value to it. It seems strange possibly, that we are not more familiar with this work than we are inasmuch as it is so near to our own field. We know, in a general way, what is being done and are interested in it as the men who are doing this plastic surgery are interested in dentistry. Our work, after all, is in a way very closely akin to plastic surgery itself. The very repairs we are making in our practical work are similar though somewhat different. We are constantly dealing with the restoration of features and cosmetics of people that come to us, and it is interesting work.

I was very much interested indeed in the work that Dr. Beck referred to in regard to the transplantation of cartilage. It seems to be that is a very great step forward in plastic surgery, not that I know anything about it from experience, but just from a purely mechanical standpoint it is going to make for a more permanent restoration of these parts, building out, retaining the contour and position of the soft tissues. I am very much interested in this work which is being done by Dr. Beck, and I am sure it is going to result in a great step forward.

Dr. Beck referred to the neurotic that comes to the plastic surgeon for the correction of these slight deformities, and it reminds me that we are not the only ones who are confronted with the neurotics that come to us for repairs. I thought the dentist was the only one who had these cranks to deal with. It is certainly exasperating, but it has been my belief and my observation, and I quite agree with Dr. Beck, that when these people come to us, and make demands for a certain type of service, a certain type of restoration, that we believe is unnecessary, or not absolutely necessary, we find we are often compelled to do those things for the reason that he has mentioned; that if we do not do them as we feel they should be done, as nearly right as possible, they will fall into the hands of unscrupulous men and much damage or injury will be done that would possibly be avoided by at least an attempt on our part to satisfy them, and we find we have to do that at times against our own best judgment. I think it is a justifiable thing to do in many instances.

I have enjoyed the paper and the discussion. I have had occasion to see with my own eyes a good deal of the work of this master, as well as the work of his brother, Dr. Carl Beck, and also Dr. Emil Beck, and it is really almost unbelievable the things that they do.

We are to be congratulated on having Dr. Beck come to us and present this subject that we may enlarge upon our field of knowledge in this work which is so closely related to our own. I want to thank Dr. Beck personally for having had the privilege of hearing his most interesting discussion of this subject of plastic surgery.

DR. C. N. JOHNSON:

I simply rise to express my keen appreciation, as a member of the Odontological Society of Chicago, to Dr. Beck for the entertainment he has given us this evening in his splendid and instructive talk on plastic surgery. These illustrations of cases which have been passed around are a perfect revelation to me. I shall myself look forward with a great deal of pleasure to the publication of this book that he mentioned, and I wish to thank him once more for his very valuable contribution.

DR. SIDNEY J. KNOWLES:

I have been pleased to hear the expressions that have been

given to Dr. Beck for his interesting and instructive contribution this evening, for the reason that I took it upon myself to ask him if he would be good enough to come here and give us a talk on this subject. My principal reason for inviting Dr. Beck was this: As one of the younger men in the profession, not knowing what the future might bring forth, I personally have been very much interested in this subject for some time. At the New York meeting of the National Dental Association I spent a very interesting evening with plastic surgeons who had served at the front and who showed a series of pictures which took up some three and a half hours. The work opened up was of such a scope that I was more than impressed with it, and it seemed to me that in a time like this it would certainly not be amiss to have this subject brought before not only the young men but older men, to realize more fully what we are likely to be confronted with, and of hearing this discussion, which has been of great interest to me. It has enlightened me on certain points, both historically and otherwise, and one of the points that occurred to me during Dr. Beck's talk was this: We are not all going to serve in France, but there is going to be great work needed here. Dr. Beck has brought that point out very forcibly in saying that a great deal of the final plastic work is going to be done away from the field of action. Necessarily a lot of the wounded soldiers will be brought back to America for final treatment. From what I saw in New York and from what I heard outside, there is a great deal of work in connection with this war for us to do. I have reference now to the prosthetic work that will be required and which it will become necessary to do on the men who come back. These men will be brought to Chicago, to New York, and to the different centers of this country for further treatment, so I believe we can well afford to get as much knowledge on this subject as possible and realize how much there is in front of us. These things are so clearly associated with our work, that if we have some knowledge of it before these cases are thrown on us, we will be able to meet the situation more intelligently. A good deal will be required of the prosthetic man, and we will have to look upon the prosthetic end of our work more as mechanical men, more as ingenuity men, as our artistic sense will probably be taxed to its limit. If present war conditions

continue, I believe we will be called upon to work very closely with the plastic surgeon. It is my understanding that in the work that has been done along the line so far, no great effort has been made at the front to make plastic restorations or to repair these injuries or wounds, other than to save tissue with the idea that the dentist who then follows with his prosthetic restorations, can do his work in the easiest possible way. In other words, considering the cicatricial tissue that would ordinarily form if the mouths and other parts are properly restored, it would be difficult work, and yet from the things that have been shown to me it is evident that that is the practical thing to do. It is more than pleasing to know what the possibilities are in this work. I had no idea of the scope of plastic work except from men like Dr. Beck, who are probing into these things and working with the idea of meeting conditions of today and the future with regard to plastic surgery. The things that probably will be done through necessity will be the things that we will marvel at.

What Dr. Beck has suggested about the use of cartilage in connection with these plastic operations may be the means of making these men presentable and useful members of society, rather than unfit individuals.

After hearing the remarks of Dr. Beck I shall go back to my work feeling the necessity of applying myself to the line of work in which I can do the most good.

Personally, I wish to thank Dr. Beck for his coming and being with us, because I know the members of this society have always enjoyed the work of the Beck brothers, and they have a kindly feeling towards each one.

DR. TRUMAN W. BROPHY:

I feel, as you all do, that we are especially honored by the presence of Dr. Joseph Beck here this evening. His coming is always appreciated and his presence brings to my mind other days when his lovable brother (Dr. Rudolph Beck), was with us, because everybody who knew Rudolph Beck loved him, and it is perhaps through his life that we are drawn in a great measure towards the three Beck brothers who have done so much in the great field of surgery, and who have won not only national but international reputations. It is a very happy condition, it seems

to me, for brothers to be engaged in the same work, that they may consult one another and profit by recent research and findings that each one secures from the work that he does.

I have known Dr. Joseph Beck quite a long time, and I never meet him without making use of an interrogation point, and I am glad to say it does not require an effort to get information from him if you will only make known to him what you want. His generosity in this particular has cost him an immense amount of time; I know it has in my case.

While sitting here this evening I was thinking of the progress of the dental profession in the half century that I have been connected with it. Even ten or twelve years ago, had one predicted that in the early part of 1918 a discussion would be presented in a dental society on this subject, it would have been regarded just as unreasonable as the late Dr. Edmund Andrews regarded the inspection of bone in a living subject without a surgical operation. In 1868 a man came to this city and proclaimed that he had made a discovery of seeing any condition of bone by the use of a certain device. I asked Dr. Andrews about it one day when I was going with him with a gas bag half the size of this table to anesthetize a patient for a minor surgical operation. I asked him about this particular thing about making inspection of bone, and he looked at me with an expression of astonishment and said, "Don't be so unwise as to suggest that to any one else." He further said, "When one can show how an opaque substance can be made transparent, it will be time to discuss the subject." Look at the roentgen photograph today. Such has been our advancement. We are steadily progressing although we sometimes think we are not. We think we are only plodding.

Consider the subject of plastics that has been presented to us tonight. The coming out of this book of Dr. Beck's will be one of the greatest advancements that has been made in this special field of work, and closely identified with the subject of plastic surgery is the practice of the dentist. All the work that has been the outgrowth of this war requires concerted action, teamwork, the analyzing of all these different branches of learning, the science of surgery and of dentistry to accomplish the end that will be of the greatest advantage to the sufferer. Dr. Beck has kindly said that I could say something

more in addition to what he has said on this subject of plastic surgery. I have been doing plastic surgery for a great many years in the field of the mouth and face. I have done many plastics in supplying half the side of the face, supplying the lips, and constructing palates out of cheeks and muscles of the pharynx and the other subjects covered here, doing a little, step by step until I secured good results. I know how much Dr. Beck has done in palatal surgery. It was Dr. Beck who first proposed and successfully carried out the bringing forward of the distal wall of the pharynx so as to make the velum meet that wall more accurately, thus making it possible for the patient to close the posterior pharyngeal opening in enunciation. Dr. Beck did this by filling in parafine beneath the mucous membrane of the posterior wall of the pharynx so as to produce a prominence that would make the passage of the palate backwards to close the space. Dr. Beck recognizes the fact that a palate would be useless so far as distinct enunciation is concerned that cannot reach back to the posterior wall of the pharynx, yet our confreres have continued to cut off the tensor palati muscles and draw the palate upwards and bring it together and sew it, leaving a big space between its distal border and the posterior wall of the pharynx, unconscious of the necessity apparently of producing a palate that would function.

A good many years ago in a moment of weakness I constructed an artificial nose for a patient. I made a very good nose. It looked quite well. The patient went to a surgical instrument house and exhibited his new nose, and from that time on I had a regular shower of people in my office who wanted me to work on their noses, so much so that I could do very little of anything else. Gradually I got out of the practice of making noses.

I found one difficulty with artificial noses, and that is the artificial nose would neither blush nor grow pale; it would always remain the same. It might be painted to correspond with the color of the face, but the color of the face often changes; the nose would not. All things considered I became rather discouraged in making noses, and so I discontinued it. Then I made some ears. I have some ears in my possession I made several years ago. The patients brought them back.

As to the palate, I am doing something just now which may be wise or unwise, but I would like to have any one of you tell me

whether you think it is right or wrong. One of the greatest difficulties I have is answering letters from physicians who say they have cleft palate patients and wish to know when I will operate on such and such a case. I cannot tell anything about the case because there are fifteen different kinds of cleft palate, and the operation that would be suitable for one case would not be adapted to another, and the time of operation depends upon the character of the cleft.

This has led me to get up a chart, which I have published in my book, on different forms of cleft palate. On this chart I explain that Form 7 should be operated upon earlier than the fifth month, while Form 6 should not be operated until the patient is fourteen to sixteen months of age, etc., etc., and that so far as the lip is concerned, it should not be operated until the operation upon the bones of the palate is done. This chart I send to the physician with the request to mark the form that nearest approaches the condition of his patient. He will mark that and send it back to me.

I am also getting up a little pamphlet with these questions: In the first place, what is a cleft palate? What is a harelip? Then I attempt to answer these questions. A cleft palate is the result of failure of union of bones in embryo. The palate is developed from its six ossific centers, two premaxillary, two maxillary, and two palatal bones.

These centers together with the soft parts that cover the bones, periosteum, connective tissue, and mucous membrane, are assembled in palate development in the same way that a piece of mechanism is. The tongue, in the second month of embryonal life, is extremely thick; it occupies nearly all the space between the mandible, which is already formed, and the floor of the orbit, the vomer occupying but little space. The tongue, therefore, may become an obstruction to union and prevent these bones from assembling. A little later, in the third month, when the muscles of mastication become active, the mandible is lifted up and acts like a wedge. The maxillary bones that have been retarded from uniting by reason of the intervening tongue, are driven further apart every time the mandible comes up. Besides, the chin, resting on the sternum in embryo, exerts force on the upper jaw and this may be a factor. If the bones fail to unite, the child will have a cleft palate, and frequently accompanying cleft palate, we have harelip.

I would make the general statement that all of us, in the early

stages of development, have cleft palates because our bones are separated; they have not yet assembled and united. Those are the factors that enter into the making of a cleft palate, and we have also the factor of heredity to deal with. We have these mechanical causes, the application of force. The question of prenatal impressions, I consider of no particular importance. Every mother will tell you that she has had a shock of some kind during the period of gestation, and in her judgment this caused the child to have cleft palate. If you make inquiry, you will learn that the shock occurred sometime about the sixth or seventh or eighth month of gestation. At that time the palate would be united, and any shock she might receive would not separate the tissues that are united. The conditions leading up to hare lip are practically the same.

I know Dr. Beck is familiar with the writings of Professor Warnekros, of Berlin, who says that a cleft palate is invariably the result of the presence of a supernumerary tooth. His associate, the late Dr. Boedeker, whom we all knew when he was living in New York, said Professor Warnekros is not far wrong, yet he is not quite right. A cleft palate, which he claims is due to the presence of a supernumerary tooth is due not to that at all but due to the infolding of the mucosa in enamel formation. All of us who are familiar with histology remember how mucosa folds down deep into the submucous tissue and forms lamina, rather broad, and that lamina contracts until it leaves an epithelial cord, at the base of which is a loop, and that cord with the broad layers of Malpighian epithelial cells form the enamel organ. With those membranes lying in that fashion, it is not unreasonable to assume that the layer of mucous membrane prevents the submucous tissue or connective tissue from meeting. Then when the other factors come in, the tongue and the mandible making pressure, one can readily see and understand how the bones can easily be moved apart; how these tissues that have not yet completely united are further separated, and why the patient has a cleft palate.

Regarding the surgical procedures of the past and those of the present, I reminded a gentleman this morning in discussing this subject that there was one thing so important at this time that everybody interested in medicine and surgery and dentistry ought to keep it in mind, and that one thing is, bringing all the teachers who are responsible for the training of young men to understand that the students

who enter our colleges should be taught what they are there for. What does the student go to college for? He goes to college in my opinion for the purpose of learning how to take care of his patients. He may know all about the intricacies of botany and chemistry, of bacteriology and pathology, and of all those branches necessary for him to know, but if he goes out of a school, as they are doing every year, without having heard so important a subject discussed as the greatest deformity known to mankind, without having heard it mentioned while a student, there is something wrong. His teachers have not come to an understanding of the seriousness of their obligations to him. A student goes out of college, and when these cases come into his hands, not having heard anything about them, not having been taught anything about them, he reads up on what he can find in the textbooks, which is often extremely meager, and then undertakes to do this operation which he does not understand and fails. It is the fault of his teachers, and not his own fault. These students will go out in this special field of work of surgery, operate and will make failures. Thirty years ago so numerous and so disastrous were the failures in this particular work, that in New York City the most eminent general surgeons they had refused to operate on palates on the ground that operations were not successful.

What is a successful operation? Is it in bringing the parts together and getting union? No! There are two objects to be kept in view in doing this work, one of which is to close the space between the nose and the mouth, and the other is to secure a condition that will enable the patient to speak distinctly. First, anatomical results, and second, functional results, and unless both of these are secured, the operation has been a failure. Some years ago it was reasoned out that about 85% of the cases failed to get union, hence the operations were not successful. In the other 15%, they failed to get function, and so the operations were not successful. To sum it all up, they were all failures, and the surgeons therefore concluded not to operate, but send their patients to Dr. Kingsley to have artificial palates made for them. Dr. Kingsley made thousands of artificial palates and did the work well. There was no one in his time who could do better artificial palate work than Dr. Kingsley.

If I were to make a plea for plastic surgery in this special field, I would urge that it be taught in medical schools. I would teach medical students how to do plastic surgery. I would give them lec-

tures on prosthesis, on the supplying of lost parts, and show them patients in order to give them an adequate idea of the importance of this work.

I want to say one thing more. I had five patients in the hospital two weeks ago, all of whom had had their premaxillary bones cut off. The surgeon removed these bones, probably, because he felt he could not get the lip together and unite it without so doing. I suppose that was his object. He found the bones were in the way. The surgeon who removed these premaxillary bones caused an irreparable deformity. There are two considerations in this special work. The first is always bone surgery, when you consider the treatment of cleft palate, and the second is always plastic surgery. If the surgeon is so unwise as to undertake to do plastic surgery first and do nothing with the cleft bone, but lets these bones go without any attention at all, or unwisely excises the premaxillary bones which are essential to give the face its normal contour, correct profile and beauty, he will make a great mistake. I am satisfied that the time will come when that practice will be discontinued. For my part, I cannot see on what ground a surgeon will mutilate a patient for life, putting him in condition where no one can bring about repair of the injury. He no doubt thinks that it is the right thing to do. It is simply because he does not know. If these surgeons did know, they certainly would not do such a thing.

This questionnaire, which I have extemporaneously outlined, I am satisfied will be of great benefit to those wishing information on this subject.

The young men of whom he spoke are going out well equipped. Theoretically, yes, but as old Dr. Cushing used to say, that high degree of digital excellence which comes only with experience, they have not had and it will be a long time before they get it. Digital training is not obtained by hearing lectures. It is not obtained by seeing pictures; it is not obtained by watching somebody operate. The experience these men will get will be attended by many failures, but we are doing the best we can under the circumstances; we are doing all we can to correct the shortcomings of the teachers who have trained these men, and when they go out following the training they are getting here, they will be far better able to assume the duties they will be called upon to perform in caring for the wounded soldiers.

DR. L. L. DAVIS:

It is useless for me to thank Dr. Beck for what you have heard this evening from him. The other speakers have done this very thoroughly. In referring to the past and present I have nothing to say, but he predicts for the future great things and great possibilities, and I see even greater possibilities for the dental profession. We are just in the era now when the dental profession and the plastic aural surgeon and dental oral surgeon are brought together by governmental decree, if such a word can be used. The government has already authorized the establishment of those three different services, and I predict for the dentist of the future a better surgical knowledge than he has ever had before, and for the medical man a better surgical knowledge of the mouth and jaws than he has ever had before, and I hope to see the association of both professions result in the establishment in the city of Chicago of a strictly oral and dental school where plastic cases only will be cared for. I think the time is ripe for such steps to be taken that we may prepare not only the dentists but the plastic oral surgeon to do the work that will surely come back to us if this war continues, as we expect it will, for some time to come. As has been said by one of the previous speakers, it is up to us to prepare ourselves for the things that will happen.

Dr. Beck's paper on this subject is very timely; it has certainly given not only myself but I think every one around this table a great deal of satisfaction and enlightenment. I only wish it were possible for all of us to have had just such a course as he has outlined in part, what he has been trying to teach some of these medical men in the colleges in Philadelphia and St. Louis and other cities.

DR. J. H. WOOLLEY:

What I would like to say is that I think Dr. Beck has built better than he knows in the growth of this idea of plastic surgery. I have been lately interested in the work of the Beck brothers and it reminds me of what Dr. Atkinson, of New York, attempted to do at one time, and that was in building up lost tissues under the gums with sponge grafting. He achieved considerable success in this work, and the excursions of cell life in building up the tissues have shown what that process of nature

has been able to do. In making restorations with paraffin the same forces are at work, although some people have ignorantly feared that paraffin would endanger the tissues from infection, yet thorough sterilization will obviate that difficulty.

In regard to prosthesis for restoring the features of the mouth through dentures and the building up of the different parts, I have always made it a custom in the past when I had a great deal of that work to do and when the teeth had to be removed for substituting artificial dentures, to have the artificial teeth restored as soon as possible, so that the tissues about the face would not become absorbed and prevent the building up of the artificial work.

I have been much pleased with Dr. Beck's work. I think he is a hero.

DR. BECK (closing):

I am going to try and answer some of the remarks that have been made because they bring out certain points.

Dr. Reid has stated that the opportunity may come for all of us to get into this work. If our soldiers get into the thick of this war there will be ample opportunities for work for all of us to do, and if they do not, we will no doubt get a large material from over the border, namely from Canada. We will not only get the injured from our allies after the war, but possibly the injured of our enemies over here to do repair work when the time comes. I have not the least doubt about it. I believe our country will be flooded with these unfortunates from across the water, so that there will be plenty of opportunity for all of us.

The point made by Dr. Roach that dental and prosthetic workers in connection with plastics are indispensable, is well taken. There cannot be any such thing as plastic surgery about the face and jaws unless surgeons and dentists work together. The plastic surgeon, the oral surgeon, the mechanic, the laboratory man, the plate maker, the man who knows nothing about medicine, must all work together.

In the Surgeon-General's office at Major Blair's desk, I have seen days spent in discussing models of plates that are suitable for certain cases. There are dozens of suggestions sent to him from prosthetic men all over the country, who believe this or that particular thing is a good apparatus to employ. At the Surgeon-

General's office they are taking an entirely different stand in regard to these things than what was taken during the first three years of the war by the French, English and Germans. Then they were waiting. The United States has taken the stand of immediate work, which was started in Leeds with Moynihan and Crile. Crile suggested at that time that immediate work should be done rather than to wait. That is one thing, and teamwork, as spoken of by Dr. Brophy, is the other. At first they have not worked in teams, but now they are doing it. Immediate work is the thing, thus getting the patient ready for better plastic work later on. Consequently the dental and oral surgeon and plastic surgeon are not to be separated. To achieve the best results they must work together.

Dr. Roach touched on neurotics in the dental profession. I must ask him to kindly tell me the type of neurotics he has to deal with in the dental profession.

As to the transplantation of costal cartilage: When I related my experience recently to Dr. Grant, of Denver, Colorado, he said to me, "For heaven's sake, I have been transplating costal cartilage for ten years and have never had any trouble." But he did not publish it, which should have been done. Many things are done that are not published, consequently some man comes out with what he thinks is an original proposition, but finds that some one else has done it before him. Recording is a very important part of our work, but is considerably neglected in this country.

Dr. Phemister stated when he returned from the European war zone that he had used costal cartilage in plastic surgery, with success.

I neglected to say in my previous remarks that Dr. Emil Beck has not neglected to do plastic surgery, like Dr. Carl Beck and myself, but he confines himself to plastic operations on the chest. He has developed an original method which has been accepted and adopted by surgeons. For instance, by his method half of the chest wall may be taken away, ribs and all tissues, and there would be a communication with the external world from the two sides. He would close up the bronchial area by cicatrization, and then line the cavity with skin by making large flaps from the neighboring region, pushing them in, in tongue

shape fashion, holding them in by packing, thus getting completely healed out spaces, instead of stinking cavities which bother the patients very much. He has applied this to other parts of the body, as, for instance, the leg and sacral region.

I was interested in the remarks of Dr. Knowles about having seen this work in New York, and hope he will become one of the active men in this work. That brings me to the question, why it was that Dr. Brophy had to do this type of work. He had to do it because no one else would do it. I have asked the same question of eye, ear, nose and throat men—why is it that not more men are attempting to do plastic surgery in our specialty, because it belongs to the field of the rhinologist and otologist? When men come to my clinic and I try to show them every point and every detail in the operation, they would answer my question in this way; they have had great difficulty in getting information; they have said that men doing this plastic work are either selfish or are ashamed to show what they are doing. They read in a medical journal of a man who does plastic surgery; they go to his clinic, spend considerable time there, but never see that man do plastic work. That is one complaint they make. The second one is that they are afraid to tackle this work for fear of a malpractice suit being brought against them, should not everything go smoothly. They are afraid of the press, the court and jury. Fortunately, such malpractice suits are decided in our higher courts, but they are certainly disagreeable while they last. A suit brought against a man for \$50,000.00 say for having done an injury to a man's nose is unpleasant to say the least. Most of these people are scapegoats who try to get a surgeon into trouble. Rather than tackle such a case, the surgeon frequently refers him to someone else or leaves it alone.

Dr. Brophy took up some phases of surgical work I left out purposely because I knew he could present them better than I could, and in bringing these matters up he gives me an opportunity to answer some questions. When he said we are progressing in medicine and dentistry, it reminded me of a debate I heard between Professor Johnson of the University of Chicago and Clarence Darrow on the question, "Is There a Law of Progress." Mr. Darrow took the negative side, and said there was

no law of progress. He simply took the negative side of the question. He could see no progress except in antitoxin for diphtheria or something of that kind. Professor Johnson, a teacher, took the opposite side and, I believe, won the debate. There can be no question but that progress has been made, and certainly there is room for more progress. The present conflict will give us an opportunity to make further progress, especially in the field of medicine and surgery.

Everybody that is doing dental work and oral surgery should take this matter of reconstructive work up seriously, because it is not one man's work or half a dozen men's work. An institute of from 50 to 200 teachers is very little to think of in the city of Chicago, and the men who are engaged now as teachers in this work, such as we are, should take up that question. I believe the suggestion of Dr. Davis should be welcomed with open arms by the government and by the Surgeon-General if such a school was started in Chicago and given the opportunity to develop it with every possible armamentarium with which to carry on the work.

The questionnaire that Dr. Brophy is contemplating I should name Brophy's catechism, and it is a good one. It is just as good as the one in the book on the type of deformities of the palate we have. I have gotten a great deal out of it, and I have copies of it which will answer a good purpose.

As to the causes of cleft palates, there is one that Dr. Brophy did not mention, and that is, cleft palates and hare lips are said to be due to inclusion of the amniotic membrane in utero and thus preventing union at the cleft.

I was much interested in the subject of creating a curriculum containing these subjects. As long as we have deans of medical schools and dental schools who favor a model curriculum, such as the American Medical Association, the American Medical Colleges, the American Pedagogic Society, and other societies favor, we will not always get an opportunity of teaching students what we would like. It takes more than a few hours of the curriculum to do that. But we do have an opportunity in the six-year course. The last year in medical schools should be devoted to the work of specialization in these branches, because

we are not able to cover even the regular course in the specialties we are asked to teach.

I do not believe it is possible to teach this plastic work in our medical schools in the way it ought to be taught at the present day.

As to the question of artificial noses and ears, I find patients object to anything artificial except perhaps dental plates, that are hidden. Patients may not be satisfied with artificial ears and noses, but the government has changed its attitude in regard to these things. If a man is a good soldier and is otherwise not hurt, it wants an artificial nose put on him as quickly as possible and let him go to work rather than turn him over to the plastic surgeon. We are opposed to that. The men interested want immediate plastic surgery done to cover the defect and do the cosmetic correction afterwards.

In a case of closure of the cleft palate, I have the picture here of a man who had had nine operations performed for cleft palate. I could not close the central perforation by the sliding flaps, on account of scars and destruction of the blood vessels. I was able to close it, however, by bringing the inferior turbinate, cutting it off to a pedicle, drawing it in to the opening and wiring it to the seared surface of the margins. That was a good result from using transplanted material. It is very important in the education of the speech even in a perfect result from a cleft palate operation. We are developing in our specialty two branches of education, namely, of the deaf and in defects of speech. There are lots of soldiers who are rendered deaf in the war, and consequently a committee has been appointed on the education of the deaf by lip reading and expression reading, as well as education of speech defects following shell shock and other trauma, as well as the palatal defects. The education for speech defect is very important after an operation for cleft or defective palate.

Teaching the principles of plastic surgery mentioned by Dr. Brophy, I try to impress the students with the three important ones, namely: I want them to know what the word plastic means. It does not mean modeling, but the word plastic means movable. I would have them remember that phase of plastics—looseness. Nothing can heal and do well if it is on tension. It must be loose. Many plastic operations fail because too much tension is applied. That is the first principle. The second principle is to know thoroughly the anatomy and where the nourishment comes from. I have seen sur-

geons go to work and supply a flap from the periphery where the capillaries are and cut off the main vessel. In some places it does not make much difference because there is much collateral circulation. A long flap must have plenty of blood supply; therefore, it is very important to know your anatomy. A third principle is a knowledge of suturing flaps. There appears to be a natural affinity on the part of tissues to come together where they should and students and even surgeons forget this and put in too many sutures. I talk to students all the time while I am working; I show them the pictures either before or after operation. I tell them what the principles are of each operation, and then I ask them to go to work and do the operation on the cadaver. For instance, in a class of 29 men sent to one of these schools for plastic surgery, I found there were only 3 men chosen or picked out so far as plastic work was concerned. The others were fit to do oral surgery and dentistry.

While it has not been within my field, I want to say that the teaching in jaw bone and mouth work is to reconstruct temporarily by dental compound any deficiency and drainage established always at the lowest point. These two principles are being thoroughly drilled into all oral surgeons. Drainage tubes are put in the lowest position to get rid of saliva and secretion, and where there is a complete loss of bony substance, to restore the part or parts temporarily with dental compounds until they can be gotten ready for the subsequent plastic work which is required.



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THE FOLLY OF POSING.

There is a species of folly growing up in the profession which can do little good and much harm. It relates to a propensity on the part of some men to pose before their fellows regarding the amount of practice they do and the enormous fees they receive. It is in a way the direct heritage of the propaganda for practice-building that raged so extensively a few years ago, and with this as with the other it is quite likely to bring discredit on the profession. To get good substantial fees for service well rendered is perfectly legitimate and wholly commendable. It places the profession on a higher plane to have the impression go out that dental service is worth a good fee and it creates an incentive to do the best work to have that work well rewarded. But to get an abnormal fee for ordinary work is demoralizing to all concerned, and worse yet to pose as getting higher fees than other men just for the purpose of making an impression as to the superiority of the claimant is foolish and mischievous in the extreme. The chief harm is done not to men who have been for some time in practice, because they know only too well the type of man who makes these boastful claims, but when a young practitioner who is struggling along in the face of various kinds of handicaps and who has to content himself with moderate fees listens to one of these siren songs from the lips of a poser, he is quite inclined to shrink into his shell and put himself down as a failure. It is in every way disheartening to hear a practitioner say in the most nonchalant manner, as if it were an every-day occurrence: "I just got \$500 for a couple of crowns," when the listener must content himself with less than a tenth that sum for

the same service. Nor does it conduce to peace of mind when a young man who is having an uphill road in practice is told by another: "My practice has never run less than a thousand dollars a month from the start."

There may be occasional cases where such extravagant statements as these will hold good, but they are very rare, and they do not constitute the general run of practice. In fact most of the grandiloquent claims made by the professional poser are fabrications pure and simple, and they should not in any sense be taken by the young man who hears them as a gauge of the actual facts in the case. It would be interesting and wholly illuminating to see the income tax schedule made out by many of these men who pose as professional nabobs.

Let the young man who finds himself disturbed by all this silly talk comfort himself by the reflection that "things are seldom what they seem—skim milk masquerades as cream," and that the men who talk so much about what they do are frequently the men whose rating by the commercial agencies would not bear close scrutiny. The fact is that most of the men who really get good fees are the ones who say least about it, and those who have acquired a competency have seldom been heard boasting of the magnitude of their practice. It is not only indecent to pose as some men are doing, but it is the sheerest folly.

THE ILLINOIS STATE MEETING.

Everything points favorably for a splendid meeting of the Illinois State Dental Society in May at Bloomington. The Local Committee are assuring us that everything at their end of the line will be in readiness when the meeting convenes, and we know from the character of the men that this can be taken at par. President Hinkins is marshaling his forces in a splendid manner, and all are working with a will. Dr. L. L. Davis, chairman of the Program Committee, promises us a most unusual program with every minute of each session filled profitably.

The Director of Clinics, Dr. C. E. Bentley, has something unique to offer. There will be clinics of two kinds, one a progressive clinic, taking on the nature of a post graduate course, and the other the regular orthodox clinic. In the progressive clinic there will be

seven subjects taught by fourteen men, making two men on each subject teaching precisely the same method in different parts of the hall at the same time. The subjects are as follows: Impressions and casts; conductive anesthesia; root-filling technic; casting; removable bridges; silicate cements; porcelain.

This array takes in the most significant things in practice today, and no man in the state can fail to be interested in some of the subjects presented. Experts in each line have been secured, and the progressive nature of the clinic renders it possible for every one in attendance to see perfectly. Then in addition there will be the regulation clinic which has been in vogue from the earliest days of dental society work. The clinics alone will be worth a trip across the state.

Bloomington as a meeting place is ideal. Bloomington Association of Commerce, an organization of six hundred and fifty business and professional men, is lending every assistance toward making the meeting a success. The Secretary of the Association, Mr. J. H. Hudson, has informed the officers of the society that the dentists may have anything they wish in the city of Bloomington for their meeting. The dates will be May 14, 15, 16, and 17; and every member should prepare now to attend. Do not fail to make your reservations early.



THE EDITOR'S DESK.

THE YOUNG LADY ASSISTANT AGAIN.

In the February number of this Department I had an open letter to the young lady assistant, and ever since then I have been hearing about it. One of the best things I have heard comes in the form of a letter from a young lady who is so very modest that she conceals her identity completely. I wish she had signed her name so that I might write to her personally and tell her of my appreciation in terms that would not look well in the glare of print. The letter is post-marked in a city about 500 miles from Chicago and reads as follows:

Dear Dr. Johnson:

Feb. 20, 1918.

Perhaps I trespass on your valuable and limited time, but please forgive me, for I feel constrained to thank you for the warm encouragement of your "Letter to the Young Lady Assistant," in the DENTAL REVIEW of this month, and for your fine appreciation of the little thorns that do beset our path. I, for one, find in your too-generous praise, and undeserved admiration, a very strong incentive to put forth every effort to attain to an efficiency that would enable me to read such a letter without blushing.

You speak of "Initiative." Full often and sorely have I felt my limitations in this respect, and had almost come to be of those who say that it is heaven-born and not to be acquired, when your energetic "Bosh!!" dispells the idea, leaving no room for argument. "Think a little more, concentrate a little more, observe a little more than on that last occasion when you felt so hopelessly but a mere routinist"—this is your advice, Doctor, is it not?

I personally shall look forward with pleasurable anticipation to that future date when you may perhaps see your way clear to again spare us some of your very precious time and coveted space to go into details of our office duties.

Yours very faithfully,

"A WOULD-BE ASSISTANT."

Now what can a man say to a letter like that? Merely this—and I say it in all candor—that the letter is so much better than the article I wrote that I am ashamed of my own effort. This young lady has initiative, she has feeling, she has quality. If all young lady assistants were of her type my letter would have been far-fetched and unnecessary—except in the sense that I tried to pay a tribute to young lady assistants as a class. Unfortunately all young lady assistants are not as well educated as this one, and education counts in all walks of life. And yet the young lady of only average education can perfect herself in the requisites of an assistant in a dental office. "*Think a little more, concentrate a little more, observe a little more,*"—that is

the whole thing in a nutshell. I spoke in my previous article of initiative. Let me give a concrete example. Last summer I wrote to the secretary of a dental society in an adjoining State asking him to send me the discussions of two men to complete the report of a meeting. I received a letter back by return mail from his young lady assistant telling me that the Doctor was away from home attending a dental society. This was about as far as most assistants would have gone, but not so with this one. She stated that she had forwarded a copy of my letter to each of the men in question with the appeal that they at once comply with my request, and not content with this, she enclosed for me the full names and addresses of the two men in question so that in case I did not hear from them promptly I might write them myself. That girl had thought, she had concentrated, she had observed. Her employer might leave his office at any time in perfect confidence that his affairs would be properly attended to in his absence. And it is this which constitutes service in its best sense. If Uncle Sam attended strictly to business in the matter of delivering mail, that young lady got a letter from me telling her in plain, and I trust in dignified, language just what I thought of her.

That kind of an assistant is a treasure to any dentist, and be it said that she is also a great comfort to herself, because, going back to fundamentals, the highest degree of satisfaction to the individual always comes from rendering the best service to others.

But here I am at the limit of my space without having said anything specific about the daily details of an assistant's duties. Some other time, perhaps.



PRACTICAL HINTS.

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Remove Mercury Stain From Gold Crown:—If you chance to have your gold crown or bridge discolored by coming in contact with mercury before being cemented to place heat it to drive off the mercury and, if necessary, restore the polish with your finest abrasive.—*O. V. Calkins, Moore, Mont.*

Barbed Broaches:—There is no “Royal Road to Success” in root canal operations but there is a “Royal Road to Failure” if barbed broaches are worked into canals filled with sulphuric acid. Neutralize acid with saturate solution of bicarbonate of soda before beginning with the barbs.—*Victor H. Fuqua, Chicago.*

To Renew Arkansas Stones:—When the surface of your Arkansas stone has become oil soaked and worn unevenly it may be resurfaced as good as new by rubbing back and forth with a planing motion upon a piece of emery cloth laid “face up” upon the surface of the laboratory bench.—*P. G. Puterbaugh, Chicago.*

To Make a Good Separating Medium:—To separate plaster casts drop a few crystals of indellible pencil in a small bottle of water, add a little alcohol for drying. Soap and water painted on plaster casts will also separate for obtaining occlusion for cusps on crowns or bridges.—*J. A. Wright, Chicago.*

To Desensitize Teeth That Are Sensitive to Scaling:—Dry sensitive part thoroughly. Apply for 4-5 minutes a hot saturated solution of potassium carbonate in glycerin on a pellet of cotton. Dry part with warm air. Repeat application leaving the cotton in place until the patient notices a burning sensation in the tooth, when the scaling may be continued painlessly. This solution will not cause discoloration.—*A. de Vries, Chicago.*

To Clean a Blocked Hypodermic Needle:—To unblock long hypodermic needles, screw needles on syringe tightly, put distilled water in barrel, hold needle in flame and apply pressure with piston. Steam is thus created in the immediate vicinity of flame which exerts pressure sufficient to unblock the needle. Reader should bear in mind that passing through flame removes the temper and care should be taken in its use.—*H. M. Halperon, Montreal, Canada.*

To Hold an Inlay While Cementing:—You are setting an inlay in the back of the mouth. You need a handle on the inlay; you cannot pick it up with your fingers to place it; it may snap out of your pliers; just a drop of hard wax on the inlay. Now warm a square end burnisher or amalgam plugger, place the point into the wax, instantly it is hard and you have the inlay so you can place it correctly after the cavity is smeared with cement and an instrument with which you can force it to place quickly, thus enabling you to use a thicker mix.—*E. J. Perry, Washington, Iowa.*

Aniline Dye as a Germicide:—The following method of preparation and application has been used with much success in my practice for the past year, in treating chronic abscess and pyorrhea. Make a solution in the proportion of about half a grain of aniline violet (Methol Violet B.) to one drachm of distilled water. Inject a small quantity of the solution into the fistulous opening of the abscess, with a blunt pointed syringe. The syringe should have a glass barrel, and the point either gold or platinum. The abscess should be treated surgically first. If necessary it should be curetted or in a case of root excision the parts should first be properly cared for. The aniline solution should be used three or four times at intervals of every other day. It may be applied with cotton twisted on a broach. In severe chronic cases or in pyorrhea pockets a small pledget of cotton may be saturated and pressed into the orifice and left for twenty-four hours. The aniline treatment may be followed with Bismuth paste as a final dressing. In using aniline dye it is necessary to use some care only on account of the color, as there is absolutely no danger because of the stain on lips or tongue. Besides the stain can readily be removed with absorbent cotton and water.—*Geo. D. Sitherwood, Bloomington, Ill.*

A New Thought About Making Plaster Models:—Making plaster models that are exact and perfect duplicates of the parts involved and at the same time strong and substantial with the thin ends and angles of the teeth reproduced absolutely perfect and of sufficient strength, and securing a model of isolated teeth standing alone at some distance from neighboring teeth, with such strength that they will not break off from the model when separating the case, or subsequently while working on the case, is often fraught with sore trials and disappointments because dental plaster does not possess desired edge and angle strength, nor sufficient strength to sustain a model of a slender tooth standing alone in many cases. The following described method will enable you to make a model possessing all the desired qualifications suggested above.. Before filling the impression with plaster fill such portions of the impression in which you desire strength and accuracy, with synthetic porcelain, or Aschers Artificial Enamel or a good quality of dental cement and while it is soft and plastic insert a piece of copper wire or staple of required gauge to give strength, leaving the staples protruding out from the porcelain or enamel, or cement, whichever you use. When hardened fill up the impression with plaster so that the protruding staples will be imbedded in the plaster thus holding all parts of the model firmly together. Upon separating the case you will find the thin edges and angles of the teeth perfectly reproduced and strong, and the isolated teeth of the model firm and strong also.—*H. A. Cross, Chicago.*



CORRESPONDENCE.

CHLORA-PERCHA DOES NOT RADIOGRAPH.

While doing some research work, relative to root-canal fillings and focal oral infection, I was struck by the large number of root fillings I had personally placed which showed a healthy apical region with the root filling only one-half or two-thirds of the way to the apex, the remaining one-half or one-third showing as though there existed an entirely unfilled canal which appeared of easy access, yet small.

I, therefore, did the following experiment which I would advise every radiographer to perform, to prove up my findings.

I prepared four small straight root canals, as found in lower centrals. I broached them with a small reamer until the broach would protrude slightly through the apical end. I flooded the canals with eucalyptol, then pumped into the canals chlora-percha as used by dentists generally for the past 30 years. This was pumped into the canal until it formed in a ball beyond the apex. A canal point was forced into the canal one-half the length of the canal, the canal point having been previously measured and cut to one-half the length of the root. The excess chlora-percha was then wiped off the end of root.

These roots were then lightly waxed to the face side of a film and exposed full time, at the usual distance. The result showed nothing in the apical half of the roots, while the canal point showed up clearly for the portion it occupied. The above is easily proven, in which case I would like to ask how much does the radiograph show us about the presence or absence of root fillings placed, these 30 years?

I am at present using a radiodescent chlora-percha made by adding 8 grains of bismuth sub-nitrate to each drachm of chloroform before dissolving in the gutta-percha.

Dentists and radiographers better try this experiment and stop to think a bit before they diagnose "no root filling" when the apical third seems open in the radiograph.

W. CLYDE DAVIS, Lincoln, Nebr.

MEMORANDA.

The semi-centennial meeting of the Georgia State Dental Society will be held in Atlanta, Ga., June 12, 13 and 14. This society will celebrate their 50th anniversary.

TENNESSEE STATE DENTAL ASSOCIATION.

The fifty-first annual meeting of the Tennessee State Dental Association will be held in Nashville, Tennessee, June 17, 18 and 19th, 1918. George L. Powers, Secretary, Paris, Tenn.

KENTUCKY STATE DENTAL ASSOCIATION.

The next annual meeting of the Kentucky State Dental Association will be held in Lexington, Ky., June 13, 14, 15, 1918. "An Amalgam Program of Special Interest." Address all correspondence to Dr. W. M. Randall, Secretary, Louisville, Ky.

**SEMI-ANNUAL COMMENCEMENT ST. LOUIS UNIVERSITY SCHOOL OF DENTISTRY,
FEBRUARY 2, 1918.**

Degree of Doctor of Dental Surgery conferred on the following: R. S. Austin, J. A. Blackburn, C. J. Carr, J. E. Durcan, E. H. Golden, F. J. Holke, O. L. Jennemann, C. E. Loveland, W. J. Lauer, H. F. C. Meyer, E. D. Rentchler, F. G. Sigrist, F. S. Viedt, N. E. Wade, W. C. Wilson. J. P. Harper, Dean.

THE CALIFORNIA STATE DENTAL ASSOCIATION.

The California State Dental Association will hold its regular Annual Session for the year 1918 in San Francisco, July 8-13. We will conduct our meeting this year on the Oklahoma Plan, and feel that we can assure all who attend a pleasant as well as a profitable meeting. Further information may be obtained by addressing the Secretary: Dr. John E. Gurley, 350 Post street, San Francisco.

ILLINOIS STATE BOARD EXAMINATIONS.

Commencing Monday, June 17, at 8:30 A. M. the Committee of Dental Examiners, State of Illinois, will hold a meeting for examination of applicants for a license to practice in this state. The meeting will be held in Room 217 County Building, Chicago. Practical examination to be held at the Northwestern University Dental School, 31 W. Lake St., Chicago.

For application blanks and further information address The Department of Registration and Education, Springfield.

FOUR STATES POST-GRADUATE MEETING.

Louisiana, Texas, Mississippi and Alabama, will hold a post-graduate meeting at New Orleans, La., June 3, 4, 5, 6, 1918. Membership limited to 350. Only members in good standing in their State societies, and dentists in the Army and Navy eligible. Membership fee to meeting \$10.00 each member. Special courses following general meeting \$15.00 each course per member. Subjects to be taught, Nerve Blocking, Technique of Root Canal Operations, Full upper and Lower Denture Construction, and Exodontia.

J. P. WAHL, Publicity Committee.

Maison Blanche, New Orleans, La.

March 8, 1918.

Dental Review, 810 Masonic Temple, Chicago, Ill.

Gentlemen: I am glad to inform you that the case of the Alliance against Taggart, which has been in the courts here in Chicago for the last four years, has been won by the Alliance on all points, the decision having been handed down about three days ago. The decision is rather lengthy and it is not possible for us to give you a detailed extract of it just now but we shall mail you one ready to go into your May issue. Very truly yours, M. D. K. Brenner, President.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

At the last annual meeting of the American Institute of Dental Teachers, held at Pittsburgh, Pennsylvania, January 29 to 31, 1918, the following officers were elected: President, Dr. A. W. Thornton, McGill University, Department of Dentistry, Montreal, Quebec; Vice-President, Dr. R. W. Bunting, Ann Arbor, Mich.; Secretary-Treasurer, Dr. Abram Hoffman, 381 Linwood avenue, Buffalo, N. Y.; Executive Board, Dr. A. D. Black, Chicago, Ill.; Dr. G. S. Millberry, San Francisco, Cal.; and Dr. A. H. Hipple, Omaha, Nebraska.

The next annual meeting will be held January 28, 29 and 30th, 1919. The place of meeting to be announced later.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS—REPORTS, NEWS AND NOTES.

Report from the President.

The Preparedness League of American Dentists has now become the recognized medium for carrying on the work relative to the preparation of our men for service prior to their entrance to training camps. It is with pride and a sense of deep satisfaction that I refer to the splendid organization of the League in this particular department of our activities, and I sincerely commend the efforts of those who have given material assistance in bringing about this situation. A development deemed most advisable was the appointment of a Director of Publicity to which office Dr. R. Ottolengui was duly elected. I will not anticipate his plan of procedure but wish merely to assure our members of our satisfaction in his election and confidence in the results to be obtained through this medium.

The present month of March is the second anniversary of the formation of the League and indicates the advantage gained by early organization for the promotion of the great work it has undertaken. Our work had continued for a period of fourteen months prior to the declaration of war and when the word came, the machinery for utilizing the services of our profession was practically completed and oiled ready for use.

We are pleased to announce the personnel of the officers of the League elected at our last regular meeting: J. W. Beach, President; O. U. King, Chicago, Vice-President; H. C. Brown, Columbus, Secretary; L. M. Waugh, New York, Treasurer; Lieutenant W. A. Heckard, New York, Honorary Executive Secretary, and Chas. F. Ash, New York, Director General. J. Lowe Young and Leland Barrett are members of the Finance Committee, and the Sub-Committee on Preparedness League of American Dentists, Committee on Dentistry, Council of National Defense consists of J. W. Beach, Chairman; J. A. C. Hoggan, Chas. F. Ash, W. D. Tracy, F. M. Casto, D. M. Gallie, M. B. Eshleman, L. L. Barber.

J. W. BEACH.

Report from Director General.

We are receiving many letters in which the writer says he has sent in his dollar but has not received his button. Owing to the large number of applications received, running into the thousands, it requires considerable time to tabulate their names and get out the acknowledgments. Also there

are not enough buttons on hand and more have been ordered. We ask indulgence in this matter.

I am enclosing also herewith the list of States showing the order in which the printed matter has been mailed. This list will show the extent to which we have endeavored to get into working order the details of the system so as to make it as easy as possible for our Directors in the various States. In this way the Director the farthest removed will receive his materials and supplies about the time they are delivered to the nearby States.

Porto Rico, Alaska, California, Washington, Oregon, Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico, Texas, Missouri, Iowa, Kansas, Nebraska, North Dakota, South Dakota, Minnesota, Wisconsin, Illinois, Arkansas, Oklahoma, Florida, Alabama, Georgia, South Carolina, North Carolina, Louisiana, Mississippi, Tennessee, Indiana, Kentucky, Michigan, West Virginia, Ohio, Virginia, District of Columbia, Maryland, Delaware, Maine, New Hampshire, Vermont, Massachusetts, Pennsylvania, Rhode Island, Connecticut, New Jersey, New York.

CHAS. F. ASH,
Director General.

Report from Treasurer.

When we started the recent drive for new members we had 5,700 members. On March 1st, the total of new members received during January and February amounted to 6,707, making a grand total of 12,407. The new members are geographically distributed as follows:

Alabama	58	Nebraska	127
Alaska	1	Nevada	6
Arizona	19	New Hampshire	43
Arkansas	60	New Jersey	137
California	461	New Mexico	15
Colorado	81	New York	675
Connecticut	73	North Carolina	69
Delaware	16	North Dakota	51
District of Columbia.....	26	Ohio	284
Florida	46	Oklahoma	157
Georgia	91	Oregon	111
Hawaii	3	Pennsylvania	451
Idaho	52	Porto Rico	19
Illinois	497	Rhode Island	35
Indiana	170	South Carolina	46
Iowa	270	South Dakota	36
Kansas	177	Tennessee	212
Kentucky	117	Texas	197
Louisiana	76	Utah	65
Maine	74	Vermont	26
Maryland	74	Virginia	72
Massachusetts	339	Washington	86
Michigan	217	West Virginia	87
Minnesota	213	Wisconsin	267
Mississippi	59	Wyoming	23
Missouri	244		
Montana	46		

L. M. WAUGH,
Treasurer.

Report of Director of Publicity.

Dr. W. D. McCarty very well epitomizes the requirements of publicity. I agree with him that publicity through the dental journals will be advantageous, but that publicity that will reach the public will serve us even better. I therefore solicit aid in both directions.

Publicity Through Dental Journals.

To thoroughly make use of this medium, the Officers and Directors should comprehend the method of dissemination and its limitations. All dental journals aim to appear on the first of each month. To accomplish this all copy must be in the hands of the editors by the tenth of the previous month. Some of the journals are nearly five days away from New York, by post. Hence I must have copy in my hands by the first of each month. It is then arranged, sent to the printer, put into type and galley proof-sheets mailed to all the dental journals, that the editors may use as much thereof as they may have space for. Thus all matter appearing in the dental journals is at least a month old when put into print. This should be taken into consideration when read. It should likewise be considered when preparing matter for transmission to me. It is difficult to state in advance just what sort of information is desirable. The Officers and Directors are requested to forward matter with the following basic ends in view: First; the increase of interest in League work by the dental profession. Second; increase in membership. Third; increase in efficiency. In regard to efficiency while suggestions are always in order, it should be remembered that the plan that fits the largest number of localities, is the best plan. Therefore, if the plan that is satisfactory to the majority does not exactly suit you, Mr. Director, adopt it anyway. Alter your own views, rather than the plan. There can be but one plan.

Publicity in the Press.

There is great need at present of informing the public of the intentions and work of the League. With public opinion indorsing our work (just for example, as public opinion indorses the Red Cross), it would be much easier to accomplish many things that now seem almost impossible.

To this end matter will be prepared and given out to the press from New York; but every State Director could help by wise utilization of the public press, and all other means of reaching the Public. The meetings reported by Dr. Milberry were excellent efforts in the right direction. Good newspaper accounts of such meetings are what we want. And don't be finicky about the use of your names in print at this time. Only "spite-cats" will impugn your motives. The newspapers will not report for us at all, if we insist on the rule "don't use my name."

The meeting reported by Dr. Kelley, in Maine, was also fine, and we publish a newspaper account thereof as an excellent example of good newspaper publicity.

In Brooklyn the Second District Dental Society arranged a special meeting for the Army Dental Corps men, and Dental Reserve Corps men. The program included papers on root resection by Dr. M. I. Schamberg, of New York, and Dr. John Egbert Nyman, of Chicago; a paper on a special splint for army use, by Dr. F. H. Nies, of Brooklyn, and motion films of bone grafting and wiring of mandibular fractures, by Dr. F. H. Albee and Dr. A. Berger respectively, both of whom were present to describe their work. The large hall was filled and one hundred and fifty stood up or sat on aisle steps. Now then, State Directors, the Atlantic and the Pacific Coasts have set a good example. Go thou and do likewise. Arrange meetings for the instruction of our soldier dentists, and invite the public if possible. Then let the newspapers print what they please.

Great care must be used, therefore, that nothing should officially be sent to the public press by any of the Officers of the League. We must obey the following order, known as General Order No. 34.

"Resolved, that all Committees and Bodies subordinate to Council of National Defense are instructed to issue no statements to public or to press without the approval of Director of Council."

(Signed) W. S. GIFFORD,
Director.

Medical Advisory Board Work.

During February, a meeting was called of the fifty dentists assigned to Medical Advisory Boards, in New York City, and an organization was perfected under the name, "The Dental Committee of the New York Medical Advisory Boards." By this meeting a more co-ordinate plan of procedure was perfected. By the time of the next big draft we hope to have dentists on all the Local Exemption Boards. As soon as these men have been appointed a joint meeting of the Medical Board dentists and the Local Board dentists will be called, and the new men will receive the benefit of advice born of experience. It was a satisfaction at the first meeting of the Dental Committee of the New York Medical Advisory Boards to find that everyone was already a member of the League.

Local Exemption Boards.

As the Local Exemption Boards will select the majority of the men accepted for active duty, and as these are exactly the men for whom the League desires to work, it is manifest that as quickly as possible we should have dentists on all Exemption Boards throughout the country. This has already been accomplished in several States, and strenuous efforts are being made to have such appointments made in all States. Therefore, to facilitate progress, it would be well for every State Director to begin at once making out lists of men who would volunteer for this patriotic duty. It perhaps would be best to ask the Presidents of local societies to select these men. Do it now! Then when the Government announces that appointments to your Local Board will be made, and asks for a list of men, you can forward your list by return mail. That would be impressive! That would be efficiency!

R. OTTOLENGUI,
Director of Publicity.

RESPONSES TO CARDS SENT OUT.

The following card was sent out from New York:

Name..... City..... State.....
Address.....
(Answer YES or NO and mail today)
Are you a member of a City or State Society?.....
Are you an active (paid) member of the PREPAREDNESS LEAGUE OF
AMERICAN DENTISTS?
Are you a member of a CITY or STATE SOCIETY Unit?
Are you already doing free work for any branch of the service?
Are you doing this work in a Clinic?
Are you doing this work in your Office?
Would you give an hour a day on request?

Inside of three weeks after 48,700 Pledge Cards like the above were sent out from the League Headquarters at New York, thousands of replies were received bubbling over with patriotism. The following are but a few of the more than "YES" replies to,

"Would you give an hour a day on request?"

"Yes, send the boys and I'll be on the job." "Yes, and more if Uncle Sam wishes." "Yes, and am 81 years of age." "Yes, will be glad to do my utmost." "Yes, put me next." "Yes, gladly, when you need me call." "Yes, I am with Uncle Sam to win and to the end." "Yes, I am 61 years of age but am willing to do what I can." "Yes, you bet, glad to serve where I can serve best." "Yes, eight if needed." "Yes, I'm in TO WIN." "Yes, it would be the happiest moment of my life." "Yes, or anything else you ask." "Yes, all day long and go broke." "Yes, have given my services to the U. S. soldiers since June, 1916, free and intend to continue doing so." "SURE WOULD." "Yes, I am 60 years of age and would give my service any time or way." From a man in the Navy—"Yes, when I am in port I am at the service of any enlisted man of the United States Army or Navy." "Yes, all the time that is necessary, all material, anything I can do." "Yes, as

many as necessary." "Yes, I am here when you want me for what I can do." "Yes, you bet your life." "I am a retired Dentist, however, I am enclosing my Dollar." "Yes, I will do my portion and more as I have done, but the *Dental Slackers* make me sick." "Yes, anyone in uniform." "Most assuredly!" "Yes, most gladly and a great deal more." "Yes, you bet I will." "Yes, sure thing." "Sure Mike." "Yes, I am giving from two to five hours a day." "Yes, more if necessary." "Yes, have already prepared 11 months fully without cost." "Yes, have been doing free work for all enlisted men since the war began." "Yes, one hour per day at the convenience of the recruit." "Yes, from eight to eleven every day." "Yes, three days a week." "Yes, to suit the convenience of the patient." "Yes, four hours a week for extracting, more if necessary." "Yes, to help the young men to get in the service." "Yes, was Dental Surgeon in the Army for nine years, nine months and three days. Been Chairman of a Preparedness League Unit." A "YES" answer came from Manitoba, Canada. Evidently the Dentist whose name we do not give moved to Canada and the card followed him. "I will loan the Government my entire office equipment." One card was signed by the wife of a Dentist. "My husband died December 10th. Had he lived I am sure he would have been proud to have given his time for his country."

"I SAVE MY HOURS AND NO ONE COMES."

The conscientious objector has not gone. We have him in different guises—much milder and more modified is to be admitted, but he is still here, though we hope in time to have him entirely eliminated, with complete unity of purpose prevailing.

A man once said, "Yes, I realize it may seem like a waste of money to give ten cents to every beggar who asks it, and I realize that possibly nine times out of ten that dime goes for booze, and yet there may be one man in ten who is in dire distress, and needing food who will not spend it for drink, and the success of his life may depend upon that morsel of food as the turning point, and I should hate to think that I had skipped him. I would, therefore, rather pay out \$100.00 in ten cent pieces to men who did not deserve (?) them, than to miss by any chance, one man who might."

And it is just so with us; we are not standing in the trenches in the snow and rain and mud hour after hour, nor are we risking the submarine, or the other terrors of war, so let's stop objecting, for objection is a degree of obstruction, and the obstructionist gives aid and comfort to the enemy.

The Government needs the help of every man and woman in the United States.

It takes two things to win a war—Soldiers and Dollars.

Men give their lives freely but the Government does not ask anyone to give money. It asks for the use of the money only and it pays \$4.00 a year for every \$100 that is loaned to it.

When you buy a Liberty Bond you loan your money to the Government. You help win the war, but you do not *give* your money; it will all be paid back to you in thirty years, or if at any time you may find it necessary you may sell the Bond.

This Bond is simply a paper issued by the Government which shows how much of your money the Government has borrowed. You take this paper twice every year to any bank and your interest will be paid you: \$4.00 a year for every \$100 you have paid in on bonds you have already subscribed to. The interest rate on the next issue of Liberty bonds is not yet decided upon.

This is not a rich man's bond. It is not a rich man's war. Every man and woman and child in the United States must help win. If you buy a Liberty Bond you are saving money for your old age and you are also helping to save a soldier at the front. Your money is still your money, but it is helping to win the war and it is safe hands.

You know you can trust the Government.

OBITUARY.

ARTHUR W. GRAY.

DIED: On Feb. 24, 1918, MR. A. W. GRAY, of pneumonia, in his 73rd year.

Mr. Gray was born at Lowell, Mass., Sept 8, 1845. He served in the Civil War from 1862 to 1864, when he was discharged by reason of expiration of his term of service. He came to Chicago just after the fire in 1871, and was engaged by Thomas and Sewell in the gold refining business. He traveled extensively for this firm purchasing gold and silver scrap.

He saw the possibilities of the sale of dental materials and teeth and prevailed upon the firm to handle these goods. In 1882 Thomas and Sewell sold out to the Chicago Dental Manufacturing Company, and Mr. Gray became manager of the Chicago branch of H. D. Justi and Son. He remained in this



position for sixteen years, and it was in this capacity that he made a most extensive acquaintance among the dentists of the Middle West. During his association with this firm the publication of the DENTAL REVIEW was taken over from its original publishers, and it was largely due to his executive ability that the journal was placed on a firm foundation. About 1898 Mr. Gray organized the Gray Dental Company, which proved unsuccessful, and about 1901 he entered the employ of Frink and Young as manager. Later he moved to Oklahoma for a few years when he was called back to Chicago to go into the Chicago office of the Harvard Company. In 1912 he entered the employ of the C. L. Frame Dental Supply Company and remained there till his death.

Mr. Gray is survived by his faithful wife, Mrs. Blanche Gray, and by a son, Dorland Gray, and a daughter, Mrs. James G. Christie. The funeral was held from the son's residence, 7116 Luella avenue, and was attended by a large concourse of Mr. Gray's business associates and friends.

In summing up the characteristics of Mr. Gray's life one is struck by several things. He probably had a wider personal acquaintance among den-

tists of the Middle States than any other man. He won men to him by his affability and charm, and when he once made a friend he always retained him. Of all the splendid men in the dental supply business to hold out a helping hand to young practitioners, he was among the first and most conspicuous, and many a prominent practitioner of today owes his first start to the encouragement and help meted out to him by Mr. Gray. He was approachable always, and had the supreme faculty of making the most diffident and hesitating young man feel at home in his presence immediately. No new beginner ever was introduced to him without leaving his presence a lighter hearted man. His sympathies with the struggles of the young practitioner were so keen that he could readily enter into his trials, and could offer suggestions which in many instances tided the beginner over the hard places. But above everything else was his abiding loyalty to his old friends, and his enduring fondness for them. He cherished his friendships to the very end, and in his last lucid moments he murmured the names of those he had known for more than thirty years.

A sweet and serene soul has departed, leaving memories which will be cherished more and more by those who knew him best. The chief loss falls upon his family, and those associated with him in business, and to these we tender our sincerest sympathy. "He was a man, take him for all in all."



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WHAT PROPORTION OF PULPLESS TEETH SHOULD BE SAVED?*

BY M. L. RHEIN, M. D., D. D. S., NEW YORK.

Mr. President, Ladies and Gentlemen: I feel highly honored by such a large assemblage of dentists, and in addressing you I feel somewhat embarrassed. You will notice the program states that I am to read a paper. My agreement with the officers of this Society was that I was to exhibit to you a motion picture, showing my work in my own office, doing some root canal filling and that I was to talk to you. I have prepared no formal paper and I have one further apology to make. It is rather distasteful for a speaker or writer to devote too much time to his own personality. There is nothing that is considered such bad form in literature as harping on the ego, but it is a rather difficult matter to talk to you on this subject without indulging in it to some extent and I consequently ask your indulgence, as I am in the unfortunate position of having started, to a certain extent, this revolutionary epoch, in the handling of pulpless teeth.

I had a rather difficult time of it 25 and 30 years ago, for at that time, when I appeared at dental and medical societies, I received a considerable amount of derision, not to say jeering at times, when I tried to show clinically, and demonstrate, as far as we were able before we had the advantages which the X-ray give us at the present time, the principles of this subject.

All the older men in practice, and those of you who have practiced in rural districts, have often heard the story of the woman whom the local physicians had given three or four months more to live; and who was restored to new womanhood from the very edge

*Lecture delivered before the Chicago Dental Society, February 12, 1918.

of the grave by the country dentist who removed all her teeth. The woman, of course, owed everything to the wonderful sets of artificial teeth which were made for her! This is not a fairy tale. It is not a story of fiction. It is the history of thousands of cases throughout the world, and especially in our own country.

In my student days, while I was studying medicine, I was, at the same time, studying dentistry with my father, and I was strongly impressed at that time with many cases of this kind. I saw during the four years I was studying medicine and getting the opportunities to practice dentistry, a hundred such women, the wives of farmers in the region outside of the City of Albany, where I was born, and where my father practiced, and it is a great pleasure to me at the present time to be able to say that all the arguments of a young man reading the dental literature of the time carefully and using all the persuasive powers that he could, were insufficient for me to induce my father to handle one single pulpless tooth. I made up my mind that it was useless to try to instill modern ideas into my father; that he was beyond redemption, and after talking to him one time at some length and telling him that it was really disgraceful that he should extract these teeth when all of his colleagues around were putting in root fillings, he said, "I will talk this over with you a month later," and during the following month, in the middle of the day, when it was my custom to return home every day, I was called to the office, and he showed me patient after patient, and his customary method was to say, "I want to show you something," and he would take his finger and put it over what he used to call a nice little gumboil, and give it a squeeze to see the pus squirt out from it. Then he had the patient tell me how unpleasant that tooth had been ever since Dr. So and So had put in the root filling. I have seen many women come in with tears streaming down their faces, with a thankfulness that it was impossible to compensate by money for the sets of artificial teeth that he had inserted in their mouths. The patients were left with a few sound teeth perhaps, and others were extracted on account of their deplorable condition. At the end of a month, my father said, "I am ready to discuss this subject with you." My father was one of the revolutionists in Germany in 1847. He had to flee from Germany. He was a classmate of General Sigel while he was a student at Heidelberg studying medi-

cine, although a dentist. He had to run away at that time and he said, "I never had the opportunity to complete my medical course, but no man can make me believe that it is a healthy thing for any individual to have an abscessed condition in his or her mouth, and as far as I am concerned, I do not propose to leave a patient of mine with that kind of a tooth in his mouth."

As I have said before, I gave my father up at that time, as a hopeless task. I took very little stock in what he said. Today I stand on a platform where it is a great pleasure and a joy to me to be able to realize how right he was in the conclusion that he came to at that time.

I have not come to my present conclusions in regard to this question in a day. My opinions today vary from what they did a year ago, and they vary considerably from what they were five or ten years ago. Everything that pertains to important topics of this kind are progressive, evolutionary, and are not reached by thinking out and then producing a finished product. But thirty years ago I realized at the outset from the clinical conditions that I saw that we did have grave constitutional defects and difficulties following abscessed conditions in the mouth, and then my attention was turned to the possibility of the preservation of such teeth in such a way as to keep those parts of the dental anatomy free from infection. Many of the older members of your Society, not very many, but I am sure that Dr. Brophy will remember when a great deal of publicity took place in the medical journals in the City of New York in the eighties on this subject, brought about by the physician's attention to diseases that they traced clinically to diseased conditions of the teeth. This resulted in a very wordy warfare at that time between the dentists and these physicians who had taken this matter up long before Hunter ever said a word, so that from that time I attempted to follow a method of practice that would be as closely in line with aseptic surgery as it was possible, and that is the only aspect in which I think the question of preserving teeth, whose pulps have died, should ever be considered. In those early days the surgeon used to go around in his amphitheater squirting carbolic acid all around the room and on the patient, and that was the Listerian method of the general surgeon when I was studying medicine. I found that was practically what dentists were doing as far as handling dead pulps were concerned. I soon realized that

there was nothing of fixed value in anything of that kind, so that I do not believe for thirty-five years, at least, I have used anything in the way of a preservative or disinfectant or an antiseptic, whether it was carbolic acid or phenol in any form in the root canal of a tooth. The entire practice of medication of that kind is absolutely without any scientific significance, and when you study the histology of the pulp and what these infections mean, you realize that your infected area is not in the root canal. We remove the pulp contents of a tooth in order to remove the source of supply of the infection, but the damage, the dangerous zone is in the periapical area, in a position where your preservative and antiseptic medication does not reach and has no value. This is continually lost sight of by those men who attempt to put up an argument against the modern method of handling and preserving teeth from which the pulps have been removed. They are unwilling to take into consideration this histological fact. The main principles are as true today as I spoke of them in the early eighties, and that was that the pulp contents must be removed, and today I say if a tooth is to be saved, the pulp contents must be removed. I say it without restriction, and I don't care how small or infinitesimal the amount of pulp tissue is that we are considering. A tooth from which any particle of pulp contents cannot be removed is not fit to remain in the human jaw, and the treatment or removal must be attended by germicidal agents and not by antiseptics or preservatives. Nothing must be done to impair the ability of the operator to make a proper diagnosis of the conditions as they exist at any stage of the treatment of such a tooth, and when we consider that at its face value we realize not only the absurdity of pharmacopeal treatment, as it has been taught in the college and handed down to us, but the injury that it works. If you have a purulent root canal, if you have a zone of infection in the periapical region, and you have removed all of the pulp contents, all the organic material; if you now go and give the long sanctioned orthodox treatment, whether it is a lot of foul smelling material we used to use forty years ago, or the refined phenol products of the present day makes no difference. When that patient returns it is impossible for you to make an accurate diagnosis of the conditions that are existing because the symptomatology of the case is distorted by the effect of the drug which you have needlessly sealed in your root canal.

In my student days, when a patient was taken sick and confined to bed, and his pulse and temperature went up, the first thing we did was to fill him with quinine. In those days the doctor treated the symptoms. He gave his patients quinine to bring down the fever. A physician of today who would practice medicine in that manner would have no following among enlightened people, because the public knows enough today about the value of diagnosis to know that it is necessary for that physician to make an accurate diagnosis before doing anything to influence the symptoms that are present. I think the simile is a very good one. If you have an obstinate case of infection in the periapical region, when that patient returns, you want to know precisely the result of your last treatment, and you can only obtain such knowledge by examining the root canal in the condition in which you left it after you finished operating. I confined myself entirely for about thirty-five years to the use of the most potent germicide that we have, and that is bichloride of mercury, using it in a solution of peroxid of hydrogen, which gives us the advantage of irrigation and at the same time obtaining a germicidal effect on our tissue. The following three principles are followed today by a few thousand dentists who have given much thought to this subject. First; the removal of every particle of pulp tissue from the tooth, whether it has become calcified or whether it is broken down by some other form of degeneration. Second; the eradication of all diseased tissue from every part of the periapical region, whether suppurating or non-suppurating. Third; the hermetical sealing of every root canal with base plate gutta-percha which at the same time encapsulates the end of the root or as much of it to seal the orifice of every foramen.

In those days we did not realize that you could have a pulp in a tooth free from infection and yet have a focus of infection in the periapical region that was being constantly nourished by a supply of pabulum from a dead pulp which in itself may not have been infected. In other words, we considered for a long time that an abscessed tooth necessarily meant a tooth where we had suppuration from infection. I may be stretching the matter a little when I say there may be no infection in a pulp of this nature, because, I am convinced there are stages in which there is no infection in such a pulp. I will show you in a few moments a case, where the pulp

was devitalized traumatically, and where there was no infection for a long time afterwards, with however infection present in the periapical region. There are many such cases where finally the micro-organisms attack the pulp itself in the same way that they attack the tissues in the periapical region. In many such cases these organisms are so insignificant in quantity and quality as not to be present when we speak of them macroscopically instead of microscopically.

There are many ways of removing such pathologic tissue. In 1890 I presented an illustrated paper before the American Dental Association, describing how to eradicate this diseased area by amputating the roots of such teeth. This is an operation that is well recognized at the present day, and is perhaps the only means that we have concerning what we can say positively, without the necessity of giving any further proof, that it is absolutely effective. In 1894 when cataphoresis was first introduced into dentistry, I began the use of the galvanic current, used as it was in that way for the purpose of treating diseased tissue by forcing the ions of electricity into the tissue. I preferred, at that time, to call it the electrolytic use of the galvanic current. It has since come to be known by the name of ionization on account of the forcing of the ions into the tissue impregnated with the medicament that is used. The field of chemistry, whether biologic or electrotherapeutic, is filled with many varying opinions in regard to the nomenclature of this subject. A number of authorities are insisting on the fact that the use of the word electrolytic is the proper term, and not the use of ionic. I have no choice in the matter, but am interested in the result of such treatment. I had used the current in this way for a couple of years for various diseases in the mouth, such as gingivitis, pyorrhea, etc., but soon abandoned it in all cases except those of periapical infection. As far as I could see, infected areas in the periapical regions treated in this way by the galvanic current, remained cured, and this was before the X-ray was introduced. From that time on I steadily decreased the number of root amputations that I resorted to in my practice.

A proof of the value of ionization or electrolyzation is not possible at the present time. I have been engaged in some research work on this subject continuously now for three years with the aid of Professor Gies and Dr. J. M. Levy. We are not in a position as yet to make any public proclamation, although I may say this of our

work, that it has tended to confirm my view of the power of the current to get rid of diseased conditions in the periapical region. Our work at present is in a most interesting period, and while our dental journals have been filled with a great deal of talk and writings in regard to the nonvalue and the value of ionization, I prefer not to express an opinion on the subject. There are a great many factors that enter into a lengthy research of this nature that makes for a number of possibilities. In the treatment of the dental granuloma, where we get a destruction of the alveolar structure; the periapical tissues are impregnated to a certain extent by the use of many escharotic therapeutic agents and hanging in the balance we have the question of what effect these agents have had in conjunction with our galvanic current, and with our ions. This means a most prolonged and comprehensive series of experiments that makes the individual who is engaged in it unwilling to express any result until the research has been completed. We know that we can eradicate this diseased area with the use of the knife, and we hope within a year or two or three to be able to stand before an audience of dentists and tell them how it can be done by means of ionization. Now we come to the crux of the whole subject; of what avail is it to put a tooth in the condition where infection is removed, and where we have destroyed all the microorganisms that exist if the tissues become reinfected? That has been the history of some of the best operative dentistry that I have observed, and I include some of my own operations in the category. The reinfection of teeth that have been laboriously treated with the utmost pains, with the utmost skill at the command of the operator, brings us to the point of looking for the reason and cause of this reinfection. All we have to do is to consider the anatomy and histology of the parts that are involved. We have the end of the root, which has one foramen or any number of foramina where the pulp has entered. Every one of these foramina is a hole that enters the pulp canal of the root in some place. In the course of life, from different causes, this hole may become filled up more or less by the inorganic deposits that have decreased the diameter of such a foramen. When we take an extracted tooth and look at it, we frequently find no trace of a foramen with the naked eye. On the other hand, when we examine such a root with the ordinary magnifying glass we generally find our foramina. On the exterior of every root, a minute small crater, so to speak, or

often numerous small craters exist—the outlets of the foramina.

Let us now speak and think of things invisible to the naked eye; of bacteria, microscopic things—things that it takes millions to gather together to make the slightest tangible impression, and thinking in that spirit, in that feeling, it is simply a logical deduction that the minute crater-like opening on the exterior of a root is bound to remain a breeding place for future infection if any microorganisms come that way. Now, the microorganism is a living object. It is very microscopic, and it has the instinct of everything that lives, and that is the instinct to remain alive and to remain alive it requires nutriment and food, and the kind of food it wants and craves for is found in the necrotic organic tissue of the pulp. We know that the streptococcus has a way of working between the layers of the tissues that envelop the dental organs, and that they are forced by the circulation and lymph along certain channels in this search for something to feed upon. Whether they find a foramen, however insignificant, or whether they find some exposed cementum, left in this condition possibly by the efforts of some ambitious dentist who has tried to cure an abscess by cutting down on to the root, not amputating it but merely removing the pericementum, which is the only protection that the root has against the invasion of bacteria, it matters little. That is the only rational mode in which these infections take place, both primarily and secondarily, and consequently it is my firm conviction at the present time that the dentist is derelict in his duty if he does not, when he handles teeth that are pulpless, consider that it is his duty to put those teeth in such a condition that they are absolutely protected against future infection; that it is not sufficient to let the patient go with the infection eradicated for the time being. Are we always able to know whether we have done this or not? I do not think so. I have reached the opinion, and it is only my own opinion, corroborated by a great deal of roentgenographic observation, that when the pathogenic tissue has been eradicated, the alveolar structure regenerates itself in the same way that structure regenerates itself all over the human body. When the ends of a fractured bone are brought together, new bone at once begins to form and the ends are welded together by this excessive deposit of bone cells. The thickened callus is always indicative of an old fracture. In the same manner when the focus of infection in the periapical region has been absolutely eradicated under proper con-

ditions, new bone cells at once form and replace the alveolar structure which previously existed in this region. Under certain conditions as observed Roentgenographically, this bony regeneration is deposited in an exaggerated form similar to the callus found where the fractured ends of a bone reunite.

Formerly when an old case of infection had received what was supposed to be the very best form of treatment for the eradication of focal infection, and rarefaction of the apical area was still found present after x-raying the parts later, no clinical importance was given to this absence of bone cells in this region. No thought was given even to the possibility of bony regeneration. These views were based on an unsound conclusion of the histologic factors involved. Today we even know that bone may start regenerating, proceed to a certain extent, and then suddenly fresh rarefaction set in produced by a new invasion of Streptococci arriving at this region and finding at least one unsealed foraminal orifice.

It is well known that a certain percentage of cases of apicoectomy are failures due to absorption of the root end. The exposed ends of cementum and dentin are not only exposed to the danger of new Streptococci, but in the majority of such cases the nutritive cells change into osteoclasts and thus destroy the root. In my early practice, wherever feasible, I capped such amputated stumps with amalgam. Today we endeavor to cap them with a thick coating of chlora-percha. Such cases are invariably successful. This is the same principle which controls the value of root end encapsulation where apicoectomy is not done.

Do not go away with the idea that I think the technic of root filling, which I shall display in the moving picture, is the only way to spell success. Dr. Callahan's technic varies from mine in detail, but the principle he aims at is the same encapsulation of the root end. It makes no difference what technic is used if the three principles which I have brought to your attention are successfully carried out. There always remains a percentage of cases where it is impossible to produce encapsulation, where in some cases it is impossible to get the root filling near the end of the root. Such teeth should either be extracted or subjected to the possibility of apicoectomy. We hear a great deal about the value of watching such teeth and preserving them until they give trouble. When we realize that the insidious granuloma may be present for some time without the X-ray disclos-

ing any rarefied area, it must be apparent to all that up-to-date practice demands the extraction of such teeth as soon as the operator realizes the impossibility of producing encapsulation.

As a profession, we suffer from the same disease that every specialty of the healing art suffers from. We are narrow. The very fact of our being specialists gives us a narrow view of the horizon of the healing art. Every ophthalmologist suffers from the same disease; every gynecologist suffers in the same way. It is a most difficult thing for a conscientious specialist to rise superior to this narrowness of vision and realize that he is treating a part of the human body.

For the future let us remember that we cannot operate in the dental field without the echo of our labor reverberating in every nook and cranny of the human anatomy.

We all have been educated to reverence the value of tooth structure, of every jot or bit of tooth. It is painful to the conscientious dentist to cut away a piece of tooth or to remove a tooth. It hurts the heroic and conscientious surgeon when he has to amputate a limb, but under necessity he does it to save life. That is what we dentists must do to save life.

We hold in our hands a scale. In one balance we place our tooth or teeth, and we know the great value they possess for the conservation of life. But my friends if you place in the balance of that scale on the other side the human heart, what becomes of the tooth or of the teeth? They fade away into insignificance. In fact, we must never lose sight of the danger of the individual to any form of disease where imperfect root canal work has been done. The dentist must acquire the same stamina and courage as the surgeon and tell the patient the operation is a failure and the tooth must now be extracted. This is not necessarily the fault of the dentist, and the patient should be so enlightened.

Even in our most successful cases it is impossible to speak of success until a year later when the Roentgenogram has shown a steady increase in alveolar regeneration. I have seen operations where all of the bone has regenerated, and a year later fresh rarefaction set in. There is only one explanation for such a result and, that is, that the encapsulation over the end of the root failed to cover some accessory foramen in the opening of which new microorgan-

isms found a nesting spot and from which a fresh focal infection started.

Base-plate gutta-percha has been found the most suitable material for root filling and especially for encapsulating the end of the root because of its compatibility with the human tissues and its unchangeable nature as far as contraction or expansion are concerned.

Having reached the point in the operation where the root canal in a thoroughly aseptic state has been dried out and ready for filling, chlora-percha made by dissolving base-plate gutta-percha in chloroform is introduced in very fluid form into the canal, which is not only filled with it but the material is pumped through the foramen. A point of gutta-percha, the diameter of which is the same all the way through, is now carried to the end of the canal and there macerated by packing it with fresh chloroform. In this softened cheesy-like condition, it is now by compression forced through the foramen and this soft cheesy-like mass is immediately thrown back around the side of the root. The chloroform volatilizes with such rapidity that the root surface under it is dehydrated, and as a result the softened gutta-percha remains firmly adherent to this surface whether or not covered with pericementum. Such is the ideal physical condition that takes place. This method is found more successful than the one formerly used of endeavoring to force the hard gutta-percha cone through the foramen. In this hardened state the cone has a tendency to protrude like a cork through a bottle on account of its rigidity. Such a result will bring thorough success when there is only a simple foramen, but where we have multiple foramina it generally spells failure of the operation.

I regret that the pressure of time prevents me from describing in detail my own technic of this entire operation, but I trust that as far as root filling is concerned, you will gather much from the moving pictures.

(Dr. Rhein exhibited various Roentgenographic lantern slides, which were followed by a moving picture, detailing the filling of a root canal in a case of focal infection.)

38 East Sixty-first Street,
New York City.

PERIAPICAL INFLAMMATION.

BY DR. E. K. WEDELSTAEDT, ST. PAUL, MINNESOTA.

In considering this subject, attention will be called to the treatment which was used for a case that occurred in my practice.

Mrs. M, a stranger, who was visiting friends in the city, came here at nine o'clock one morning and complained very bitterly, regarding the condition of an upper left central incisor. The tooth was so exquisitely sensible, that touching it with just the tip of the tongue, caused an increase in her annoyance and misery.

Ten years before, Dr. C had made a beautiful gold foil operation in the mesial surface of the tooth and from that time on, there had never been any trouble until the day before. About noon on that day, the tooth became uncomfortable and each hour after that time the uncomfortable feeling had increased.

The teeth and gums were washed twice with warmed sterile water and then, the examination was made. The diagnosis was, a simple inflammation, of the periapical tissue which was due to the poisons as liberated from a dead pulp. There was not a condition of alveolar abscess of the first class.

The rubber dam was adjusted so that the crowns of the upper incisors and cuspids were exposed when it was in a position. A number nine Ivory clamp was adjusted to the lame incisor and it was supported by using some warmed modeling compound. The teeth, dam and the clamp were washed with alcohol, a few blasts of air dissipated it. A large serrated amalgam plugger was now placed against the tooth and it was handed the assistant who held the instrument firmly against the tooth. With a clean and sharp bur, a cavity was cut in the lingual pit. The cutting was continued until the pulp chamber was entered. On removing the bur, pus and dark colored blood flowed freely from the cavity. The pus and blood were absorbed with cotton. When the blood and pus stopped flowing, the cavity was cleaned and then dried with alcohol on cotton. A drop of oil of peppermint was picked up, between the points of the table pliers, and placed into the pulp chamber of the tooth. A small, clean dry cotton dressing was placed in the cavity, all the surplus oil of peppermint was then absorbed with cotton. The walls of the cavity were moistened with oil of eucalyptus, a base plate gutta percha

operation made and trimmed to form. The pressure on the tooth was then stopped, the rubber dam was removed and the oral cavity washed with warmed sterile water. A metal prop was at once adjusted to the lower left second bicuspid. This prop held the jaws apart, thus preventing all striking of the occlusal or incisal surfaces except on the prop. Inquiry regarding the elimination revealed the fact that the patient was in need of a saline laxative, which was at once given in a glass of warmed water. The patient was dismissed with an appointment for a sitting, but at a time which was forty-eight hours later. But, if the trouble began again, she was requested to return at once. Forty-eight hours later, she put in an appearance and the oral cavity was prepared for the rubber dam adjustment. The prop was first removed, for it had fulfilled its purpose. The rubber dam was adjusted and after cleaning the teeth, dam and clamp with alcohol, the gutta percha operation and cotton were removed from the cavity. All was found to be sweet and clean. There was not any evidence of pus or blood. Two or three drops of oil of peppermint were at once placed into the cavity and through this medicine a freshly disinfected broach was used and the pulp removed. The root canal was then cleaned and thereafter dehydrated with alcohol. The alcohol was absorbed with cotton which had been wound on broaches. When all was dry, a clean and fresh mass of cotton was placed on the broach, a small amount of oil of peppermint was used on it, it was then placed in the root canal, a small cotton dressing was placed in the pulp chamber, a base plate operation made and the patient given an appointment for a sitting but at a time, which was just two weeks later.

She came at the appointed time and on removing the gutta percha, the cotton was found to be sweet and clean. The root canal operation was at once made. (Assuredly the rubber dam was in situ.) Oil of peppermint was used for three reasons.

First: It was just what was indicated.

Second: It was the whitest remedy in the office.

Third: The effect of its action was known.

To enter into a discussion regarding these three things would mean, writing a very long essay. It is felt, that this is wholly unnecessary to do. A brief discussion, however, of each of the three things named, should answer every purpose.

The remedy used was indicated, because there existed a condi-

tion of inflammation in the periapical tissue. That inflammation was in need of relief. It is also very true, that that inflamed condition was directly caused by the poisons as generated in a dead pulp, but, the pulp being dead, needed no treatment. Only live tissue has the power to make use of medicine. No sane man would treat a putrescent condition of the pulp for a condition of periapical inflammation. Using the oil of peppermint, was all sufficient to inhibit any further bacterial development and so it answered a two fold purpose. First, it assisted Nature in her efforts to cause a greater degree of activity of the protoplasmic matter in the periapical tissue and next, by its antiseptic power it assisted to arrest all further bacterial development within the root canal. Thus it answered every purpose. Let this much of the discussion in relation to this part of the subject end here for the time being.

The remedy used was a white remedial agent. White colored remedial agents are the only ones to be placed in the root canals of any tooth, because of the tendency of dark colored remedies to discolor the teeth. In the case under consideration volatile extract of eucalyptol (not the oil) would have answered as well as did the oil of peppermint. Normal salt solution or oil of cloves (if white) would also have been of use and the use of either remedy would have been followed by equally as excellent results as were obtained with the use of the oil of peppermint. But, the remedial agent should be light colored and the lighter the better, because of the danger of discoloring the tooth. The effect of its action was known. In using oil of peppermint, its first action was to produce a condition of negative chemotaxis and amid such a condition, phagocytosis cannot take place. But, the condition which Nature was battling with, was inflammation, and thus she was in need of a remedy which was nonirritating. The oil of peppermint was nonirritating. It did, on the start, produce a condition of negative chemotaxis but in its reaction, a condition of positive chemotaxis quickly took place and this was the means of giving Nature the assistance which she was in need of and which she desired.

If we, in our use of medicines, would bear in mind that Nature does the curing and that medicine should not be used for the sole purpose of curing the disease, but rather as an adjunct to Nature's efforts to better help herself than if the medicine had not been used, everything would be much more simplified. This whole theory and

practice of treating inflamed periapical tissue, could then be placed on such a foundation as to be very easily standardized. But to standardize this matter, is a most difficult thing to do, because, it calls for men doing some thinking so as to differentiate the conditions and this means, putting forth an effort. Very few men are willing to do either of these. Yet, that is just what must be done and, until it is done, this matter of treating simple conditions of inflammation as they involve the periapical tissue, will remain just as it is at the present time and that is, where it practically has been for the past seventy years.

To speak of the foundation treatment and remedial agents or half a dozen other things as they relate to this special subject, is not necessary in so far as it concerns the individual case which has been considered. What has been said of it, only pertains to the case which has been under discussion and it does not include the treatment which should be followed in all other cases unless those cases are similar.

Conditions of inflammation call for the use of only one class of remedial agents. These agents should be bland and soothing, because, such remedies are more in harmony with the cellular elements. Being non irritating, they tend to assist Nature to more rapidly make a cure of the disease than if they had not been used. Bland and soothing agents are never irritating. Too many men, at once remove the dead pulps and in doing this, infect the periapical tissue with the poisons as contained in the dead pulp. As a consequence, a condition of alveolar abscess of the first class is invited and too often results. Where such a plan is followed, some bland agent like oil of peppermint, is often used and the remedy used is blamed for causing that condition of alveolar abscess to form. It is not the remedy that was used which should be blamed for the creation of the trouble, but rather, the faulty technique that was used.

For a number of years, men have been using powerful and irritating poisons for treating conditions of inflammation, as these have involved the periapical tissue. In complaining of "the awful time," which followed their use, these men, have often said, "The medicine is alright, but the conditions are all wrong." Nowadays, however, after infecting the periapical tissue and using, let us say, oil of peppermint, the complaint is different. It is "Oil of peppermint, is the

most irritating of all our remedial agents. Every time it is used, it is followed by an alveolar abscess."

It is not the oil of peppermint which is at fault, but quite something else. Oil of peppermint, is not an irritating remedy, which anyone can prove who wishes to do so, by merely testing it on the tongue.

The tongue is the proper place to test all dental remedial agents for it will quickly give any man all the evidence which he may desire of the properties of the medicine which he is testing. As these medicines affect the tongue, so will they affect all other parts with which they come in contact. As a rule, the tongue is always normal and therefore, it can be relied on.

The key which unlocks the door which leads to success in the handling of conditions of inflammation as these involve the periapical tissue, is cleanliness and not the use of irritating and poisonous agents. The use of such remedies, is always for a specific purpose, which is, to destroy tissue. In dealing with conditions of inflammation, there is no indication on the part of Nature that she desires anything of this sort done, therefore, if tissue is not to be destroyed, the use of a poison is not indicated.

The entire procedure, as it relates to the case which was treated and to which attention was called, may be likened to a series of seventeen steps. One follows the other. That easily standardizes the whole procedure.

First:—Clean hands, clean teeth, clean soft tissue, clean instruments, clean rubber dam.

Second:—Examination.

Third:—Diagnosis.

Fourth:—Adjustment of rubber dam.

Fifth:—Wash operative field with alcohol and hold tooth firmly in one position.

Sixth:—Open into tooth to pulp chamber only.

Seventh:—Allow escape of pus and blood.

Eighth:—Clean cavity in tooth (not pulp chamber).

Ninth:—Use medicine.

Tenth:—Cotton dressing in cavity.

Eleventh:—Absorb surplus medicine.

Twelfth:—Use oil of eucalyptol on cavity walls.

Thirteenth:—Make gutta purcha operation.

Fourteenth:—Remove dam.

Fifteenth:—Use warmed water in oral cavity.

Sixteenth:—Adjust prop.

Seventeenth:—Elimination.

IS IT STRUCTURE OR ENVIRONMENT?*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.

It will be noted that this essay starts with a query, and it may be possible that it will end with one. The question relates to the difference of opinion still existing among the members of the profession as to whether the significant factor in dental caries is the character of the teeth themselves or the conditions which surround the teeth. In other words is it structure or environment? Much may be said for and against either proposition, and it is well that the profession study this matter more and more carefully till a final solution is reached.

This study must inseparably be linked with the manifestations of susceptibility and immunity in the mouths of our patients. We know from observation that the mouths of some individuals are very susceptible to dental decay, while others are practically immune. We also know that there is a great variation in the degree of susceptibility manifested at different periods in the same mouth. The question is does this variation relate to differences in the tooth structure, or is it due to differences in the environment which surrounds the teeth?

For a long time the opinion was quite prevalent that the varying manifestations of dental decay were due to a resistance or a lack of resistance on the part of the tooth tissue; that some teeth were "harder" than others and resisted the active agents of decay, while others were "softer," and thus succumbed. For the time being the fact seemed to be overlooked that in the various chemical analyses that were made of the teeth by different men the percentages of organic and inorganic material ran along with astonishing uniformity, that there is very little variation in the chemical constituents of the

* Read before the Odontological Society of Chicago, Feb. 5th, 1918.

teeth of different individuals; and moreover that what little variation there may be seems to have almost no relation to the susceptibility or immunity of any mouth.

This question of "hard" and "soft" teeth is a very natural one, and it is easily explained. Dentists in operating on the teeth discovered that in some instances the tooth tissue would break down quite easily under cutting instruments, while in others it was stoutly resistant. The natural inference was that in the one instance the teeth were soft and in the other they were hard. This idea planted itself in the minds of dentists, and from them it found lodgment in the minds of patients. In its practical bearing it proved a very disastrous theory to promulgate. It gave the impression to many people that their teeth were too soft to be saved by filling, and they were accordingly frequently condemned to the forceps, when a conscientious effort on the part of the dentist and patient would have saved them.

A careful observation of the phenomenon presented by the difference in the behavior of teeth under cutting instruments will reveal the fact that this difference is confined for the most part to the enamel, and that it does not relate to any variation in the chemical constituents of the teeth, but to the mere mechanical fact of the difference in the arrangement of the enamel rods. As every one in the profession knows, the enamel rods stand with one end resting on the dentin and from this radiating out toward the external surface of the crown of the tooth. It is the particular manner of this radiation that controls the resistance or lack of resistance of the enamel to cutting instruments. In some instances the rods radiate in a straight, regular, and almost parallel manner; while in others they pursue a wavy irregular course; this difference in the arrangement of the rods making the difference between enamel which cleaves easily and that which resists the instrument. It is well illustrated by the homely example of the difference between splitting straight-grained maple and bird's-eye maple. Every boy brought up in the country knows what a joy it is to split straight maple as compared with the grief attached to the attempt to split bird's-eye.

In breaking down enamel overhanging a cavity with a chisel it will be found that the enamel cleaves readily in line with the rods, but it is almost impossible to break the rods across. This proves that the strength of the enamel rests in the rods, and not in the ce-

ment substance which holds the rods together. In straight-grained enamel the chisel may be so applied that the enamel is cleaved away along the line of the rods, thus separating them where they are cemented together without breaking off the rods themselves; but in the wavy variety this cannot be done. In order to break down wavy enamel it is necessary to fracture across many of the rods and this is what chiefly constitutes the difficulty in cutting such enamel. But the significant fact remains that if a chemical analysis is made of the two varieties of enamel it will be found that they are practically the same, and a matter of still greater significance is apparent in the fact that so far as susceptibility to decay is concerned the one enamel is as susceptible as the other. That is one enamel will take on the beginnings of decay as readily as the other, provided the environment is the same. Of course there may be a slight variation in the rapidity with which caries penetrates the two kinds of enamel. Manifestly the acid of decay cannot travel so rapidly down along the cement substance of enamel in which the rods are wavy and irregular as it can beside rods which are straight, but this does not alter the general fact that in a susceptible mouth both enamels are attacked with apparently equal facility. In other words there was never yet enamel laid down in the human mouth that would resist decay if the conditions surrounding the tooth were favorable to the development of caries, while there are assuredly countless numbers of teeth in which the enamel would be found to break down easily if cut into, and which seem thin and frail in structure, but which remain free from decay for a lifetime.

Another consideration relates to a fact already referred to—that we note in the same mouth great differences in the tendency to decay of the teeth at different periods. All of us have noted this, a typical instance of which is a child with rapidly developing caries up to a certain age, when, if proper attention is given the teeth, there seems to be a cessation of the carious process and the establishment of immunity. Then again, let this same patient later in life undergo some prolonged physical or mental tension, and the teeth are likely to begin to melt away with caries almost like snow before the summer sun. What is the reason? Is it because the structure of the teeth has changed so that at the one period they are more vulnerable to attack than at another? Do the teeth grow hard and resistant at one time, and soft and susceptible at another time? Is it not a fact

that of all the tissues of the body the teeth are the least subject to change of any? In truth are we not told that the teeth are the only organs of the human economy which are not constantly being torn down and built up in the physiological processes of nature; that the teeth when once laid down and calcified in the jaw remain to all intents and purposes the same through life? Cut a piece from a muscle and nature will fill in the wound; break a bone and nature will proliferate new cells and mend the break, take a section from a nerve trunk and nature will restore that nerve to an incredible length, as has so frequently happened to the discomfiture of the surgeon and disappointment of the patient in operations for neuralgia.

But what shall we say of teeth? Fracture a cusp through the enamel and see if nature will restore that cusp. Not in a lifetime. Nature seems to have appointed the teeth as the one and only stable structure, not amenable to the same laws of constant change as are the other tissues. All of which points to the fact that when we see these varying manifestations of susceptibility and immunity to dental caries we are not logical in attributing them to changes taking place in the structure of the teeth themselves, but rather to changes occurring in the conditions surrounding the teeth—in other words to environment.

And this must be looked upon as a most fortunate circumstance. If decay of the teeth were due to the character of the tooth tissue the dentist would be helpless in the face of it. As has just been seen we cannot hope to change the structure of the teeth themselves, but we may hope to change the environment. And in this one direction lies the future promise of limiting, and eventually of preventing, dental caries.

By the foregoing it is not intended to convey the impression that the tooth remains wholly passive under the carious process, nor that there are not structural defects in the teeth which largely influence the formation of cavities. When a cavity begins in a tooth from whatever cause, and the dentinal fibrils are reached, there is an effort on the part of the pulp to protect itself by a deposition of calcareous matter in the pulp chamber at the point where the decay threatens; and if the approach toward the pulp is sufficiently slow it will be found that the pulp will recede indefinitely, all the while throwing out a deposit of secondary dentin to fill the pulp chamber at this point. This has been noted frequently in cases where the

tooth has been worn down by mechanical abrasion, leaving the original outline of the pulp chamber clearly marked and filled with new tissue. This proves that so far as the pulp is concerned it is not inactive under the approach of caries, and to this extent it may be said to have some resistive function against decay, but it must be noted that this is confined to the pulp, and it is not operative till decay has actually started. It has nothing whatever to do with enamel nor to any resistance against the inauguration of caries in this tissue.

Then again we have structural defects in the tooth tissue due to faulty development, and in these defects we frequently find the beginnings of decay. Pits and fissures in the enamel left by a failure of the islands of calcification to coalesce and form a continuous covering to the tooth are often the seat of caries, and in this light the tooth structure may be said to be at fault. But two very significant considerations are worthy of note in this connection. We find that there are many mouths in which there is no decay even when these pits and fissures are present in the enamel, and not only this but in susceptible mouths we see decay occurring in surfaces of the teeth where there are no pits or fissures and no structural defects of any kind. We are all familiar with the fact that the proximal surfaces of the teeth are looked upon as the most vulnerable to attack of any, and we know that at this point the enamel is as perfectly laid down as any place on the tooth.

In the light of all this it must be obvious to any one that the significant factor in dental caries lies in the environment in which the teeth are placed rather than in the inherent quality of the tooth structure itself. This in reality is a most fortunate thing, because if ever we hope to control decay or to prevent it, we must do so through the medium of changing the environment rather than changing the teeth. As we have seen we cannot change the teeth after they have once been erupted, though we may well hope to change the conditions which surround them. And all the virtue from oral prophylaxis so far as limiting dental caries is concerned comes from this very thing. Those enthusiasts who have proclaimed that by oral prophylaxis they have improved the tooth structure and rendered it more resistant against decay have merely polished the surface of the tooth and made it so smooth that it

is thereby more readily kept clean. This is a very important function to perform, and it is deserving of all praise, but the profession should not delude itself as to what actually happens. The polishing does not change the internal structure of the tooth—it merely places the surface in such a condition that external agents cannot act upon it with the same facility. It also removes for the time all those influences of environment which tend to act upon the tooth—the gelatinous material under cover of which the microorganisms form their acid and attack the enamel. It takes away such mechanical irritants as deposits of all kinds, overhanging fillings, impinging edges of banded crowns, etc. All of these irritants tend to keep the surrounding tissues in an unhealthy condition and it is the change in these conditions around the teeth by which the greatest value of oral prophylaxis is expressed.

Unfortunately at the present time it is difficult to state in exact terms what the significant factor in dental caries really is. We know, as has already been intimated, that one mouth is susceptible and another immune, but we do not know what particular agent or influence makes the difference. Various men from time to time have suggested various elements as the deciding factor, but no one to date has given us a working theory by which we could unerringly demonstrate susceptibility or immunity in a mouth. Miller proved of course that decay was brought about by the presence of an acid produced by micro-organisms, but micro-organisms may be found in every mouth, immune as well as susceptible. There is something aside from the mere presence or absence of micro-organisms which controls dental caries, and until we know just what this is we cannot proceed definitely or logically toward the task of eliminating decay from the mouth.

This does not mean that we are helpless in the presence of decay, and limited only to the make-shift expedient of filling cavities after they have occurred. It is true that many in the profession are doing this very thing in a wholly perfunctory and routine way, looking no further than the mere fact of a cavity and a filling. But modern dentistry can offer something better than this. While the effort to administer drugs to change a susceptible mouth to an immune one has not met with the success which its advocates had hoped, yet there are other means by which we may proceed to bring this desirable consummation about. We

cannot stop the tendency to decay in all cases, but we can do so in many; and in every case we can, with the co-operation of the patient, work a very great improvement and keep down the decaying process to reasonable limits.

Resolved to its ultimate analysis it is merely a matter of cleanliness, and the intelligent practice of oral prophylaxis is the most effective means of bringing about cleanliness yet suggested to the profession. The judicious periodical removal of all gelatinous material from the teeth, the massage of the gums by the finger or tooth brush, the polishing of the teeth to keep the surfaces bright and glistening, and this kept up as a duty by the dentist and the patient will ultimately change the conditions in the mouth so that there will be a greatly lessened tendency to decay. This does not mean that it is justifiable for the dentist to promise the patient, as many are doing, that "a prophylactic treatment once a month will prevent decay"; nor does it imply that the term "prophylaxis" in this connection is a wholly correct one. It is even doubtful if this term should ever have been introduced, and used as the profession is using it today, because in many instances it is a misnomer. But the systematic plan of procedure as outlined under the head of oral prophylaxis presents to us at the present time the most promising means of limiting dental decay, and if this is true it comes very nearly answering the question at the head of this paper, "Is it structure or environment?"

Viewed in the light of what we now know, while the structure of the tooth may have some influence on the progress and rapidity of decay, the dominating factor in its incipency is the environment in which the tooth is placed.

SANITARY DUMMIES.

BY E. T. TINKER, D. D. S., MINNEAPOLIS, MINN.

When Dr. Hunter condemned modern dentistry with a special reference to that work done by American dentists, referring more especially to crown and bridge restorations as they were generally constructed, there is no doubt but what he had good grounds for his opinion, and it is due to him and other investigators that both the profession and the laity have come to look upon mouth restoration from a different angle.

Formerly, the uppermost thought in the minds of the operator was something to chew on as well as to fill the spaces made vacant by loss of teeth.

In the past few years we have developed two distinct types of bridgework, namely, removable and fixed.

There is a large percentage of the profession who believe that each type has its place in dentistry and should be used where indicated. When a case presents in which either type may be used, the principal advantage claimed for removable bridgework is sanitation.

A certain proportion are of the belief that a fixed structure cannot be placed and keep the soft tissues in a sanitary condition. With that proportion of the profession I wish to take issue, for I know by clinical experience that such an indictment is entirely uncalled for and cannot be substantiated when the proper construction of fixed dummies is carried out.

We cannot construct dummies by the old method of setting our facings high on the labial side of the ridge, producing a shelf on the lingual surface with no regard for interproximal spaces, tooth form, contact points and embrasures, and proper occlusion, without which no bridge, no matter of what type of construction, can be successful.

We will all admit that porcelain produces the best occlusal surface from a masticating standpoint, but we must also grant that porcelain in contact with the gingival tissues, comes nearer to producing a condition of perfect health than any material outside of the natural tooth itself.

Consequently, any dummies which I shall show in the accompanying cuts, will have entire porcelain contact with the gum, and gold occlusal surfaces, as we believe that the lesser of the two evils caused by the gold, should better be borne by reduced masticating surfaces than by unhealthy gingival tissues.

I shall take up first, the replacement of teeth where extractions have been made previously, and the gum tissue is in a healed state. *Figure 1* is largely self explanatory. Select facing "A" contour and length of the crown of the tooth which was extracted. In the average case this will be approximately two-thirds of the length of the space to be filled by the dummy. Bevel the gingival third of the labial surface in a line bringing the

point of the porcelain tip "B" to approximately the top of the ridge or slightly labial to it. Grind facing "C" on both mesial and distal from about the point paralleling the pins, so that a slightly convex line drawn from that point of the apex will give us the proper interproximal space "D." Take porcelain with a fusing point of 2,300 degrees, build it to an excess on the facing, and bake to a high biscuit. Grind to fit the model, place back in the furnace and carry to an overbake, remembering that this porcelain tip is merely to produce a sanitary condition, and that

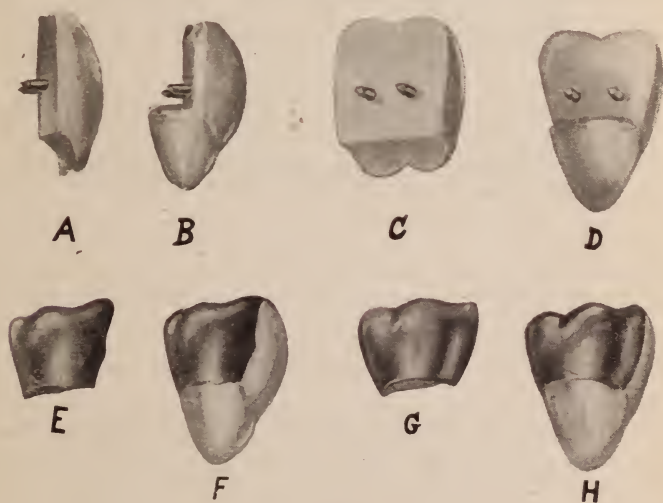


Fig. 1.

it adds nothing whatsoever in the way of strength to that bridge. Consequently, porcelain baked to an impervious surface for this work, would be ruined were it baked to the same degree for an inlay or crown, and if at any time before completion and setting of bridge, this root surface becomes roughened by grinding, it must be reglazed, as it cannot be polished by any method high enough to prevent it absorbing the fluids of the mouth, and becoming just as much an irritant to gingival tissues as an etched enamel surface on a natural tooth. "E," "F," "G," "H" represent the gold occlusal attachment completing the dummy.

Figure 2 represents the proportion of our dummy from occlusal to gingiva which should be occupied by the gold and porcelain.

Figure 3 gives us approximately the proper shape of a dummy, its contour, point of resting upon the gum and interproximal spaces. Under normal conditions, the soldering joint should include the occlusal third and interproximal space accupying the middle and gingival third. Every surface of these dummies is convex ex-

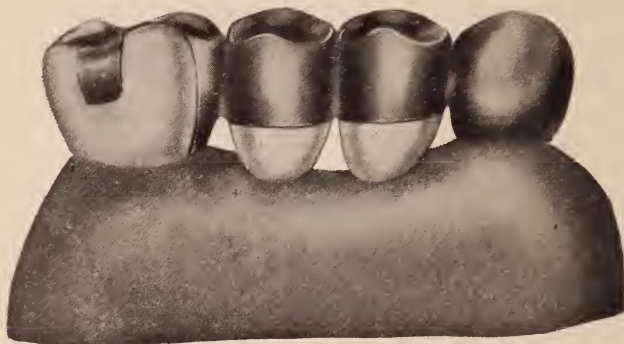


Fig. 2.

cepting the extreme occlusal point of interproximal space. They should be so constructed that with the aid of the tooth brush and silk tape the patient is enabled to cleanse every surface. No full denture, removable bridge or fixed structure will be any more

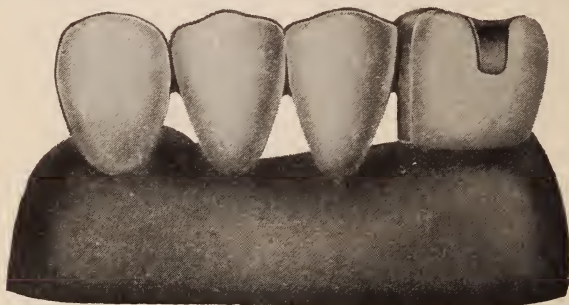


Fig. 3.

wholesome and sanitary than the wearer is pleased to keep it, and it is up to us as dentists to produce restorations which are possible of proper cleansing.

When a bridge is to be constructed involving any of the bicuspid or six anterior teeth, and extractions have not been made, my favorite method of replacement is to insert porcelain roots

from one-fourth to one-half the length of the root of the natural tooth, having the bridge entirely constructed before such roots are extracted. Place the bridge in position at the same sitting that the teeth are removed, being sure that the socket is thoroughly curetted at the time of extraction.

One essential feature of this work is that the porcelain root must take the shape and entirely close the orifice of the root socket, tapering from beyond this point to the root tip. These cases are advisable and are attended with excellent results when we have not extensive necrosis. Very little absorption takes place. The gum tissue hugs the porcelain root very close and remains in an exceedingly healthy state, in fact, many cases of over three years' service can hardly be told from the abutment next to it, mainly because of the way in which they had facial contour.

I will mention a few details of construction. Prepare abutting teeth and make your abutments. Fit them in the mouth and take a full impression in modelling compound, by the core method. Remove abutments and place them in position in the impression and run. Mount full case on an anatomical articulator. Study your radiograph of roots to be replaced. Approximately outline on the labial surface on your model with a lead pencil, the direction and length of such roots. With a sharp lance cut away the crowns, definitely outline gingival margin and excavate sockets of the model to approximately $\frac{1}{3}$ to $\frac{1}{2}$ length of the root. Proceed to grind facing in position. Bake on porcelain root and carry to high biscuit, grind to fit socket and glaze.

The remaining part of the construction does not differ from any other bridge excepting this, that on the lingual surface of these dummies, they should conform to the anatomy of the teeth they are to replace. When the roots are extracted, the bridge should be tried in position first without the porcelain roots to be certain no warpage has taken place during its construction. Remove and place facings in their respective positions without cement, and replace in the mouth. Should the root bind at any point it should be dressed with a stone, after which reglaze and cement to the bridge. Set the bridge with gutta-percha stopping temporarily, it being my practice to never cement one until from one to three weeks have elapsed after extraction, for the reason

that we may encounter secondary infection, and were our bridge cemented, a great deal of trouble would result.

When you have determined that the tissues are in a healthful state, remove bridge and thoroughly sterilize both the sockets with iodine and the bridge with a 50 per cent alcohol solution,

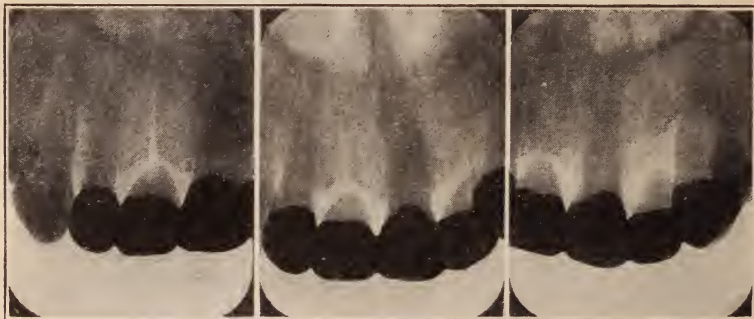


Fig. 4.

and cement, being careful that nothing comes in contact with the porcelain roots which might possibly carry infection into the sockets.

Figs. 4, 5, and 6, are made from X-rays to illustrate foregoing remarks.

Where we have one tooth to replace and the teeth on either

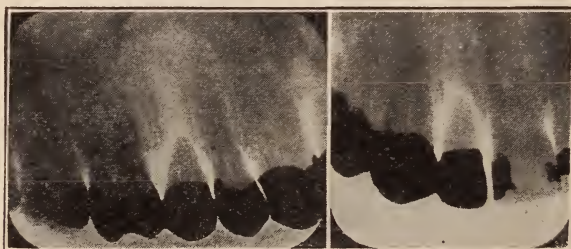


Fig. 5.

side not affected with pyorrhea, it is a good practice to use simple inlays or some other form of inlay attachment, as in cut, Fig. 7, soldering the dummy to the distal one only, and making a socket on the distal contact point of the anterior inlay. The diameter of this socket is slightly larger at the orifice than at the bottom, rendering a slight movement of each abutment possible without bring-

ing any stress on either one, in other words breaking the stress between the abutments, a feature you all must realize as being invaluable up to a certain point in any case where two or more teeth are tied together. The construction of this work is very simple and the only feature necessary to enlarge upon is taking our impression and making the model. The impression must be



Fig. 6.

taken with modelling compound, the reason for which will be seen later. Seat your impression in the mouth and while the modelling compound is in a moulding state, remove about $\frac{1}{3}$ the distance away from the teeth, repeating this at least twice, in order that all undercuts may be broken. Now hold the impression firmly in position until entirely hard. Remove abutments

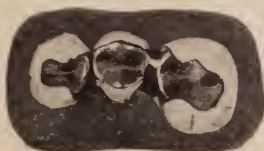


Fig. 7.

and place in their positions in the impression. The inlay which carries the socket must have a very thin film of wax melted over its cavo-surface. Mix a quantity of technic cement and pour the impression of the tooth carrying this inlay, including one or two anteriorly to it. Place a tack before it hardens. The rest of the impression pour with any good soldering investment compound. When the model is separated apply a hot spatula to the inlay in the cement tooth which will melt the wax and allow you

to remove the inlay from the cavity. This must be done for the reason that when the dummy is carved in wax including the lug which rests in the socket, in order to remove for investment and casting, the mesial inlay will have to come also, and then be separated from the wax dummy.

After this is cast, it is fitted to this inlay, replaced on the model, waxed to distal inlay and soldered. This idea can be used in many diversified ways in small bridge restorations. It has its advantage over the old type of the rest lug bridge from the fact that there is no lost motion giving undue stress on the abutment which carries the dummy. It can be controlled for each individual case by the taper given the lug. The more taper the more motion, the reverse being true.

REFORMING AND STAINING OF ARTIFICIAL TEETH FOR CROWN AND BRIDGE WORK.

BY GEORGE A. THOMPSON, D. D. S., CHICAGO, ILL.,

Director Department of Ceramics, Columbia University Dental Graduate
School, New York.

The possibilities of artistic restorations secured by reforming and proper staining of artificial teeth will be a revelation to those who will master a few fundamental principles. I use the word artistic in its broadest sense—displaying perfection of design or conception with an accurate reproduction of nature in our finished piece of work.

We have accepted from the manufacturers for years teeth totally unfit to use in our restoration. The teeth show no sign of wear or age and every patient who needs services of this character is at a period of life when use has left its mark upon the teeth. In justice to all concerned we must not place all the blame on the manufacturer, as the output of any business is based upon the law of supply and demand—it seems to me a serious reflection on the dental profession, to put it mildly.

We hear a lot of criticism of the anatomy of artificial teeth which is true, but when we examine the work found in our patients—what do we see? How near is the anatomy carried out on the large inlays, large amalgam fillings? What do the crowns

we find resemble? Did you ever see the anatomy of the lingual surface of an incisor properly reproduced? How many men even understand the vital importance of the perfect reproduction of this surface anatomy? The usual form given is convex in all directions, which is wrong. The correct form is concave in all directions with a mesial and distal marginal ridge, which is very important as they prevent food from being forced into the embrasures which causes the irritation you always find around crowned



Fig. 1.

Natural teeth used for models and study.

anterior teeth unless the lingual surface anatomy is perfectly reproduced.

When we construct a crown on any tooth in which the occlusal or incisal surface is exposed to view we have failed miserably unless we reproduce accurately the correct incisal stain or the discoloration in the occlusal grooves. Our anatomy may be perfect but the crown will stand as a monument to our inartistic ability and will be recognized as such by the layman unless we reproduce the little defects found in the surrounding teeth.

The first thing to do is to make a collection of natural teeth—



Fig. 2.
Natural teeth for study purposes.



Fig. 3.
Natural teeth used to study and aid in reproduction.

get as many as you can in good condition, sort them out and arrange them in groups mounted on wax. Keep them in boxes and when you are working have them before you constantly. The great-



Fig. 4.

Even illustrations will aid in reproducing accurately.



Fig. 5.

Study of bicuspid.

est artists that ever lived always worked with models, and we as dentists should never put ourselves in a class above them. I do not care how much you may think you know about the anatomy of teeth

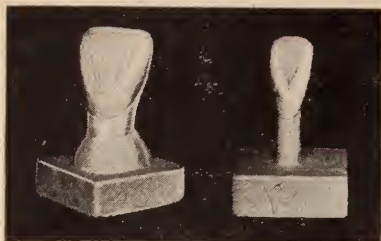


Fig. 6.



Fig. 7.

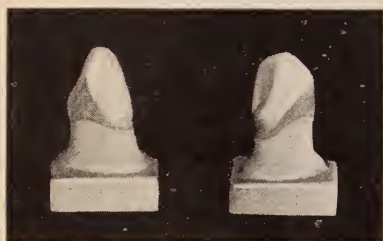


Fig. 8.



Fig. 9.



Fig. 10.



Fig. 11.

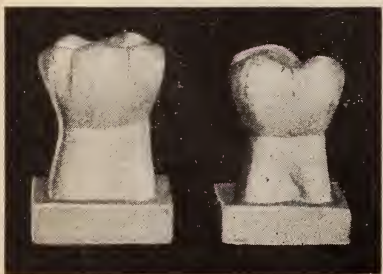


Fig. 12.



Fig. 13
Cross-section to
show the rough-
ened surface.

if you will work in this way it will surprise you how much more you will learn. I have a collection of thousands of perfect specimens of natural teeth and I use them constantly with profit.

In a previous article I spoke of the roughened surface of the anterior teeth—how the action of light affected the color of the finished crown depending upon the marking you made upon the labial surface. An accurate knowledge of this can only be had by a close study of natural teeth.

About ten years ago I started to stain teeth with the Lennox china colors, but as this is a thin surface stain we had to exercise



Fig. 13B.

Stain to be used on Ash's tube teeth.

care so as to not polish it off at the lathe. Some did much better service in the mouth than others, but eventually all were brushed off, or probably dissolved in the saliva. Most of you may not know it, but glass is slightly soluble in water and it may be that the thin colors which I put on went into solution in later years.

I next used the S. S. W. and Ash's mineral stains with better success, but in jacket crown work, when I wanted to stain the occlusal surface, the area was always where the porcelain was the thinnest. I doubted whether it was advisable to reduce this more by adding a stain, the strength of which was doubtful. I baked up a crown, using one of the mineral stains, and tested its strength. I never used it again on the occlusal. The thought then occurred to me—why not get porcelain, made the same as the por-

celain I was using, but colored to match the stains? I had them made and started to test them. They proved satisfactory in every way and I use them in most cases.

One set of special stains has a fusing point of 2,450 degrees. The fusing point of all the facing and plate teeth manufactured in this country is between 2,450 and 2,460 degrees, notwithstanding the fact that some manufacturers claim otherwise. The 2,450



Fig. 14.

degree stains are for this class of teeth. The other is 2,560 stain and is used for jacket crown work. These stains are never used without mixing. The various colors are white, gray, blue, pink, yellow green, brown, black, and orange; definite proportions by



Fig. 15.
2560 stains.

weight are thoroughly mixed with a starch solution (saturate solution of corn starch and water), then add the gum tragacanth (2 ozs. gum tragacanth to 2 quarts of water—let it stand twenty-four hours and strain); you should have a porcelain of the consistency of putty. Pack it in some form of split mould which is slightly oiled (lard oil), and bake it to what is known as a carving biscuit, which is about 600 degrees in the furnace. Remove it and mark it with a porcelain pencil (Faber 351). The number marked on the button will always remain. Return to the furnace and bring to the fusing

point. Make a record of what each button contained and it will be invaluable to you.

With porcelain jacket crowns that demand stains the area to be stained is cut away before the first bake, and the proper stain as selected from your experimental buttons is placed in on the second bake.

When you wish to reproduce the faint little lines of fracture we so frequently see on the labial surface of the incisors, cut into



Fig. 16.

This represents the method employed in tooth factories of mixing porcelain. The time required is two to three hours.

the porcelain with a cataract knife which is very delicate, bake to 2,450 degrees, add your stain before the second bake. White spots can be quite accurately reproduced by baking to full contour on the first bake and then grind away with a stone the area to be stained white. Replace this with the same color you cut away and it will appear as an uncalcified area of enamel unless you cut too deep.

The roughened labial surface is always done after the staining is finished,—use fine stone and a diamond graver, which is a pencil-like instrument made of a black diamond. After you have had some experience in surface reproduction you can make a chart as shown in Fig. 24. Examine with a Hastings lens the surface

of the surrounding teeth and record the imperfections on the chart. Use a glass similar to Fig and the apparent difficult piece of work will be greatly simplified.

To stain the occlusal surface of a jacket crown after the porcelain is packed and carved to occlusion, cut out the grooves with the cataract knife and bake to 2,450 degrees. Add your stain (mod-

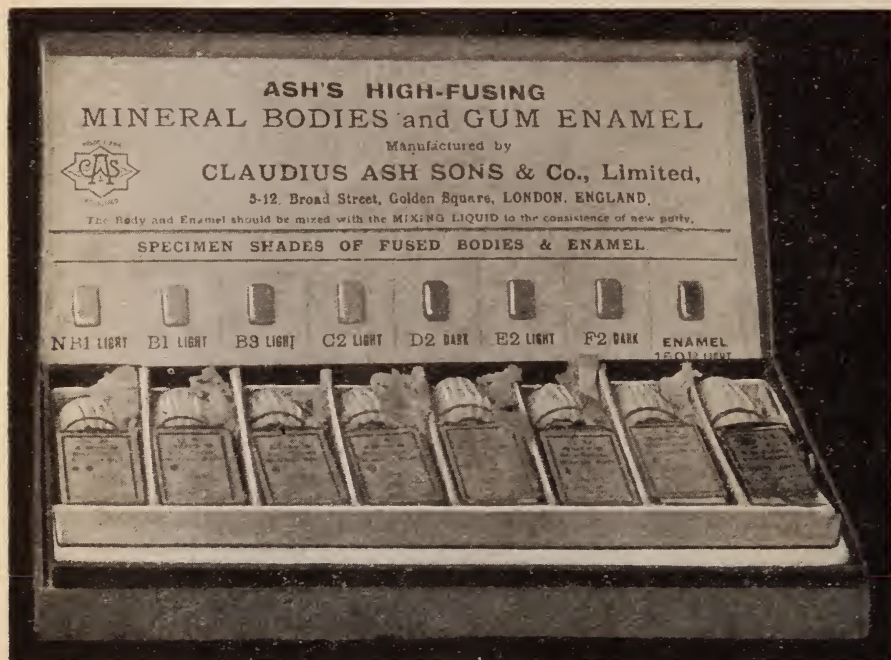


Fig. 17.

Porcelain to be used to modify Ash's tube teeth.

ified brown), and when the crown is finished it will be the last word in a natural artistic reproduction.

The highest type of plate work and removable bridge work is done with full contoured teeth. We have three methods to follow. First: Detachable post crowns of the different manufacturers. The crowns are ground to occlusion and the forms modified to meet the individual case. Here again let me emphasize the importance of natural teeth as models and the use of a good skull. The groove and marginal ridges on the occlusal surfaces are cut with fine stones and then carved with the diamond graver. Diamond drills are used

to drill into the area around the dentin horns for stains. On the anterior teeth two holes are drilled on the incisal at the mesial and distal which are united with a knife edge stone. Lines of fracture



Fig. 18.

A type of box which can be used so as not to waste porcelain.

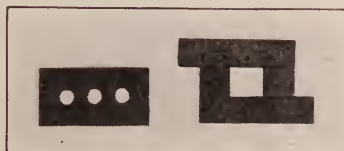


Fig. 19.
Split moulds.

on the labial are made with the diamond graver. Wash the teeth carefully with stiff brush and gold dust—add your stains and place on a tray filled with white bird sand or coarse silex, and place in the furnace and bake to 2,450 degrees.

Second: Secure the large moulds made by the Consolidated



Fig. 20.

S. S. White's mineral stains can be used on the labial surfaces, but should not be used on the occlusal of jacket crowns.



Fig. 21.

Lines cut in porcelain before the first bake to be filled in on the second bake with the stain.

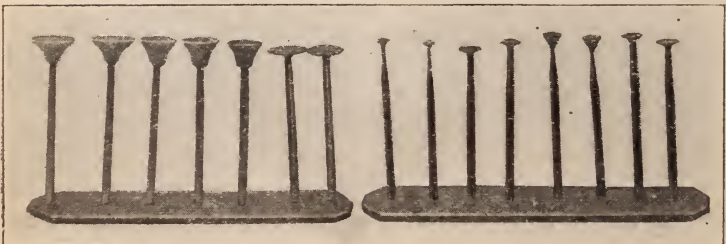


Fig. 22.

Stones to roughen the surfaces.

Manufacturing Company. Modify to the requirements of the case and grind to the occlusion. Then order from the Consolidated Company the same set in a biscuit baked crown. As you have the bis-

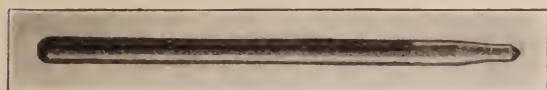


Fig. 23.
Diamond graver.

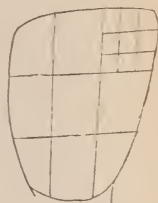


Fig. 24
Diagram chart
to map out im-
perfection on a
surface.

cuit baked tooth and the baked tooth you can get an idea as to the shrinkage. If your lower first molar biscuit baked measures 16 mm. and your baked lower first molar measures 12 mm. you are going to have that much shrinkage when you fuse your biscuited



Fig. 25.

tooth. If you take two pieces of steel, shaped so that when they are put together they will be a double-end caliper then rivet them together so that when they are opened one end will register 16 mm. and the other end will register 12 mm. you will be able to tell the size of your crown when it is fused. By using the caliper it will be a simple thing to carve the biscuited teeth so they will reproduce the teeth already ground to meet the case. With your cataract knife cut

away the areas to be stained, add your 2,560 degrees and glaze. The result will be beautiful.

Third: Carve up in plaster one-fifth larger than the tooth needed. Make a split mould of fusible alloy. Use the Justi High



Fig. 26.

Fusing porcelain with starch and gum tragacanth, place the porcelain in the mould, the incisal color first, then the gingival, according to the chart. Biscuit bake and modify as to the anatomy and cut away for stains. Drill out the post holes and bake to 2,450 degrees. Add your stains and glaze. 2500°.

The following formulae will be found to be of value for producing stains on the incisal surfaces of the teeth:

Cork Color.

White, two parts; yellow, one part; orange, one part.

Orange Brown.

Orange, two parts, with three parts of brown.

Amber Yellow.

Orange, one-half part; brown, one-half part; black, one part; white added to get desired tint.



Fig. 27.

Buff.

White, two parts; yellow, one part.

Dull Yellow.

White, four parts; yellow, five parts; green, one part.

Orange Brown in Hue.

Mix in one part of black, one part of white, two of orange.

Very Dark Brown.

Mix six parts of black with two parts of orange and one part of yellow.



Fig. 28.

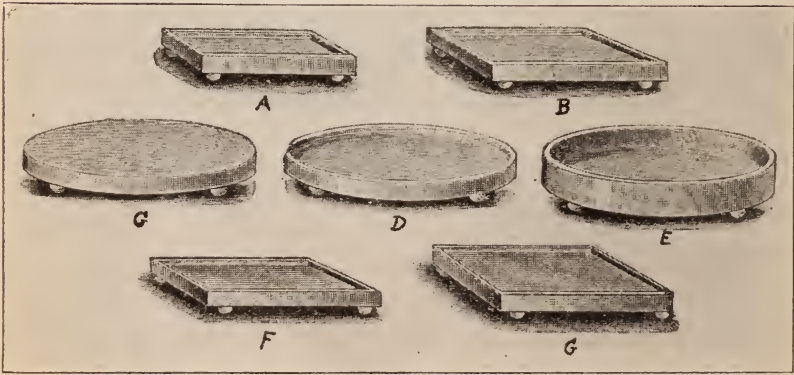


Fig. 29.

Amber Brown.

Mix six parts of brown, four parts of yellow, two parts of orange.



Fig. 30.

Agate mortar and pestle is the best for mixing porcelain powders.



Fig. 31.

Mould to experiment with to determine fusing point.



Fig. 32.
Cut out for labial stain.



Fig. 33.
Cut out for incisal stain.



Fig. 34.
Distribution of porcelain to reproduce on Justi shade guide.

Tan.

Mix one part of brown, three parts of yellow, five parts of white.

Bronze Brown.

Black, five parts; orange, one part; green, one part.

Straw Yellow.

Mix three parts yellow, one part brown.

JUSTI HIGH FUSING PORCELAIN FOR JACKET CROWN AND VENEER WORK.

Use No. 1 at incisal, No. 3 at gingival to make shade	1	Justi Shade Guide.
Use No. 2 at incisal, No. 3 at gingival to make shade	2	Justi Shade Guide.
Use No. 3 at incisal, No. 6 at gingival to make shade	3	Justi Shade Guide.
Use No. 2 at incisal, No. 4 at gingival to make shade	4	Justi Shade Guide.
Use No. 3 at incisal, No. 5 at gingival to make shade	5	Justi Shade Guide.
Use No. 6 at incisal, No. 5 at gingival to make shade	6	Justi Shade Guide.
Use No. 7 at incisal, No. 6 at gingival to make shade	7	Justi Shade Guide.
Use No. 8 at incisal, No. 4 at gingival to make shade	8	Justi Shade Guide.
Use No. 9 at incisal, No. 4 at gingival to make shade	9	Justi Shade Guide.
Use No. 10 at incisal, No. 4 at gingival to make shade	10	Justi Shade Guide.
Use No. 11 at incisal, No. 5 at gingival to make shade	11	Justi Shade Guide.
Use No. 12 at incisal, No. 21 at gingival to make shade	12	Justi Shade Guide.
Use No. 13 at incisal, No. 4 at gingival to make shade	13	Justi Shade Guide.
Use No. 14 at incisal, No. 5 at gingival to make shade	14	Justi Shade Guide.
Use No. 15 at incisal, No. 5 at gingival to make shade	15	Justi Shade Guide.
Use No. 16 at incisal, No. 5 at gingival to make shade	16	Justi Shade Guide.
Use No. 17 at incisal, No. 21 at gingival to make shade	17	Justi Shade Guide.
Use No. 18 at incisal, No. 21 at gingival to make shade	18	Justi Shade Guide.
Use No. 19 at incisal, No. 4 at gingival to make shade	19	Justi Shade Guide.
Use No. 20 at incisal, No. 5 at gingival to make shade	20	Justi Shade Guide.
Use No. 20 at incisal, No. 21 at gingival to make shade	21	Justi Shade Guide.
Use No. 22 at incisal, No. 23 at gingival to make shade	22	Justi Shade Guide.
Use No. 18 at incisal, No. 23 at gingival to make shade	23	Justi Shade Guide.
Use No. 24 at incisal, No. 23 at gingival to make shade	24	Justi Shade Guide.

PORCELAIN INLAY.

The cavity preparation cannot be included in detail. Most cavities requiring porcelain inlays are gingival third cavities. Next come the proximal cavities in the anterior teeth not involving the angle. Third in order are the proximal cavities involving the angle. For this class a gold inlay is first made and set, cutting out the exposed portion and baking a porcelain inlay. The gingival third cavities are prepared with rubber dam and the new Ivory cervical clamp. The impression is taken in modelling compound with Dawsett's set of impression cups—made by Ash Sons & Company. The model is made of amalgam packed under pressure. The matrix is formed by fitting the model in a special press which is to be shown on the screen. The platinum is placed between two thin pieces of China silk which are vaselined—pressure is brought upon the foil with a water bag which slightly conforms it. It is removed, annealed and trimmed, placed in position as before, but more pressure is exerted. This will usually conform it. Burnish the matrix and clean all the vaseline from model and matrix. The porcelain used is the same as for the crown, using the same shade chart.

The shrinkage can be overcome in two ways—painting the mar-

gin with shellac or cutting a figure X across the porcelain. It is packed in position under great pressure, having a clean piece of rubber dam between the porcelain and rubber swedger. (Figs. 35, 36.) The first bake will fill, probably, two-thirds of the matrix; the second, the area where shrinkage occurred; the third, the entire inlay



Fig. 35.



Fig. 36.

is built up. The advantage of pressure packing is less shrinkage, more dense porcelain and better margins as well as being a great time saver.

Etch with a fine stone and set with Fleck's Cement.

MAKING YOUR MONEY EARN MONEY—SAFELY.

A Series of Articles on the Conservation and Increase of Savings.

BY GEORGE LEE M'CANDLESS, CHICAGO, ILL.

ARTICLE V.—A DISCUSSION OF TWO GOOD BONDS.

If a student of investments should have occasion to make a careful selection from bonds listed on the New York stock exchange, he might very naturally decide upon those of the Montana Power Company and those of the Midvale Steel and Ordnance Company. Assuming that this investor has given Safety the first consideration and that he has wanted a proper amount of diversification for a small sum of money to be invested, let

us discover his reasons for placing his funds in the obligations of these two companies.

It would be quite natural for such an investor to give first consideration to a public utility enterprise but, especially in such a time as the present, he would also consider that labor problems might have an adverse effect on a street railway company and that coal and transportation difficulties might result unfortunately for others. He would note that such a well established company as the Peoples Gas Light and Coke Company of Chicago has been losing money because of the increased cost of the things which go into the manufacture and delivery of their product—gas. But these things would not discourage the investor, in his hunt for a public utility company which could satisfy all his requirements, because there are a few such companies independent of such difficulties as coal supply, transportation difficulties and problems of labor. These are the hydro-electric companies.

Of course such companies as these may have their problems of competition, cost of development in harnessing water power, lack of diversified outlets for developed power or lack of a constant supply of that power—water. However, it may readily be seen that such companies are based upon one of the fundamentals of economic public existence: the supply of electricity from the otherwise wasted energy of falling water. This means electricity at a minimum cost.

We will now discover the reasons why, among other similar companies, this investor should select the Montana Power Company.

The Montana Power Company, through a number of hydro-electric developments, does the greater part of all the electric light and power business in the state of Montana—a territory about equivalent to that of New England. This company has been in operation for twenty years. It has only about 40,000 customers but does a most diversified business. Vast agricultural irrigation projects are dependent on the Montana Power Company for the supply of electricity for pumping power. There are numerous mines which must be pumped day and night to prevent their filling up with water. There are cities to be lighted and industries to be supplied with the power furnished by this

company, and the Chicago, Milwaukee and St. Paul Railroad is a customer for the electrification of over 400 miles of its road. The Montana Power Company has a wonderful asset. The water used comes from the Yellowstone National Park where the trees can not be chopped down and where the melting snow lasts all summer keeping the rivers full.

Every year notes increased profits for the Montana Power Company. Furthermore, the small percentage of gross returns required for operation reflects the efficient management of the company. For every dollar taken in seventy cents is available to pay interest charges on bonded debt. This is most unusual. A railroad is known to be well managed if twenty cents is left for this purpose from every such dollar. A leading banker once said, "There are a lot of public utility companies but there is only one Montana Power Co."

Because of the foregoing reasons and because of the fact that Montana Power Company 5 per cent bonds, secured by excellent property mortgages, have sold as high as $100\frac{3}{4}$ on the New York Stock Exchange and are now quoted around 90, it would seem reasonable for this investor to select these bonds.

Having selected a safe bond for the investment of half his present funds, let us assume that this investor, with a canny eye for profit possibilities where security is not diminished thereby, looks about for an opportunity to place the rest of his funds to the best advantage. In this case he might well select the convertible 5 per cent bonds of the Midvale Steel and Ordnance Company.

Steel experts and students of world affairs generally believe that a great future is in store for the steel industry. During recent years, requirements for steel in more modern construction work have increased continually. Now these requirements are held to a minimum while construction programs are deferred so that this industry may concentrate upon the present important business of winning the war. When the war is over, these deferred plans together with new and necessary rebuilding plans should require a continuation of steel manufacturing activity. Furthermore, the United States is now the richest nation on earth and this should not diminish our naturally rapid progress. For these reasons it would seem that steel should play an important

part. It would therefore seem that the future of the second largest steel company in this country should be a bright one. This should particularly be the case for the reason that such a company owning its own mineral reserves in mining properties estimated to be sufficient for all purposes for at least a half century, builds all its finished products from the ground up. A company taking the raw product from its own mines and manufacturing almost everything known to the steel industry from this basic product, should be able to withstand periods of readjustment of material prices. Such a company is the Midvale Steel and Ordnance Co.

The Midvale Steel and Ordnance Company is a combination of four of the oldest companies in the business. Consolidated by a group of the most prominent steel experts at a time, which was exceedingly ripe, and acquired by a capital investment of \$100,000,000, this company was able to show earnings for the first year of better than 30 per cent.

It seems incredible that the 5 per cent bonds of such a company should be selling around 80. These bonds are not only the fixed obligation of this strong company but are secured by deposit with a trustee of stocks worth well over twice these \$50,000,000 bonds. Also there is a convertible privilege attached to these bonds which allows a holder to convert each bond into ten shares of capital stock at any time. Of course this privilege is not a profitable one now but may be very valuable at some future time.

So it might easily be conceived that an investor, having confidence in the future of this country's prosperity and desiring to take advantage of the present to anticipate a portion of it, would purchase these convertible secured 5 per cent bonds of the Midvale Steel and Ordnance Company.

CHICAGO DENTAL SOCIETY.

A regular meeting was held February 12, 1918, with the President, DR. P. B. D. IDLER, in the Chair.

DR. M. R. RHEIN, of New York City, spoke on the question, "What Proportion of Pulpless Teeth Should Be Saved?"

DR. ARTHUR D. BLACK:

Mr. President, Dr. Rhein and Members of the Society: I regret very much indeed that Dr. Gilmer could not have been here to open the discussion upon this paper. However, as he asked me if I would take his place, I could not refuse to do so.

Dr. Rhein has given us a talk with much of interest in it. It is always pleasant for us to have one from New York read a paper before our Society or some Chicago man go to New York and read a paper, as there is always opportunity for differences of opinion, because so many things are done differently in New York from what they are here. However, I am going to endeavor to be agreeable tonight and to discuss principally, but not entirely, those things with which I do agree, and which I should like to emphasize, leaving those things for disagreement to the next gentleman who is to appear on the program. (Laughter.)

I read a few days ago a short paragraph by Benjamin Rush, of Philadelphia, published in 1818, just a hundred years ago, in which he called attention to the fact that he had observed in the period from 1770 to 1776—I don't know why he mentioned those particular dates—a number of cases in which serious systemic conditions had resulted from mouth infection. It was interesting to note this statement by a great physician so many years ago, showing that many pioneers recognized those things which both medicine and dentistry have only come to recognize in a small way quite recently.

I want to emphasize what Dr. Rhein has said in relation to the value of the teeth and the human mechanism which he exemplified by the example of the heart; that it is imperative to keep the heart going, even though we must sacrifice a tooth or two, or may be all of the teeth, for that purpose. We as a profession must come to see this thing more clearly. We must get ourselves away from the idea that the only function we have in life is to save all teeth. We must learn to discriminate better

than we have heretofore between those teeth which we ought to save and those teeth which we ought not to save, and to weigh in the balance, as suggested, the value of the particular tooth against the danger that tooth may present to that particular human mechanism. We have not yet reached the place, in the consideration of tooth having an infection about its root, where we can draw the line definitely as to whether the tooth should be extracted or should be retained, and until we do know more about this subject, I think it behooves us to err on the side of the heart rather than on the side of the tooth.

I wish to compliment these moving films, which Dr. Rhein has shown us, as representing his first two attempts at having a movie made of these operations. Any man who has attempted to use a dictagraph will remember how foolish he felt during his first talk to the machine. One must feel somewhat the same embarrassment at an attempt to do a stunt of this kind, and I am sure we are all tremendously interested in this film and appreciate some of the difficulties which were encountered. It ought to be an encouragement for more men to attempt this same thing, because it is a method of teaching which must, I think, be of more and more value to us as time passes.

There are certain biologic problems presented in connection with this whole proposition of the changes which take place about the apices of the roots of teeth, and I would like to emphasize what Dr. Rhein has laid stress on, that we are not concerned with the root canal other than as a technical proposition of finding out where it is, enlarging it and filling it well in the apical portion. If this is done in a case in which the periapical tissues are not already involved, we should have little concern as to the future of such a tooth. It is in that group of cases, in which the tissues about the apices of the root have been destroyed, with which we are most concerned. As Dr. Rhein has said, our studies must, in the first place, be based on the histology of these tissues. Our study of the histology necessarily carries with it a study of the function of the various cells concerned, and especially of the functions of the specialized elements within these tissues—elements of connective tissue or of epithelial tissue which are different from the connective tissues or epithelial tissue found elsewhere in the body. Then, we must take into consider-

ation the possibilities of regeneration of these tissues in cases in which they have been changed from their normal structure. In this connection we cannot very well overlook the common rule that infections, which invade tissues containing specialized elements, usually destroy these specialized elements, and these specialized elements are not rebuilt following the subsidence of the infection. We may see this in practically all of the specialized tissues of the body.

When it comes to the question of regeneration of the periapical tissues, we must recognize the fact that there will be regeneration of some of these and not of others. Therefore, we must draw the line. We know that bone will regenerate when it has an opportunity, when the source of infection, or when the irritation, whatever it may be, is removed. We know that the alveolar process is true bone, and therefore we may expect the regeneration of the bone of the alveolar process within certain limitations. We may especially expect the regeneration of that portion of the bone of the alveolar process which is about the apex of the root, because it is that portion which is down in the body of the bone itself and it would be rebuilt even if the tooth were extracted. We ought not to expect, however, and I know Dr. Rhein does not expect it, that there will be a rebuilding of the specialized elements of the periodontal membrane when they are destroyed; consequently we have no right to expect in any of these cases reattachment of the surrounding tissues to the surface of the root. That is one factor that the dental profession must recognize, first of all, in the consideration of cases of this group. When that fact is well recognized throughout the profession, we have a reasonable basis of procedure.

When we come to the question of root encapsulation, there is where Dr. Rhein and I part company, because I do not believe in it. I do not believe in it because it is inconceivable to me, in the first place, that in any considerable percentage of cases, a complete encapsulation of the denuded root end with gutta percha is possible, and secondly, I do not believe that the gutta percha is any improvement over the root end so far as healing is concerned. I appreciate the fact that foreign bodies may be encapsulated within certain tissues of the body and remain so for many years without giving apparent trouble. I have a

radiograph of the arm of a cousin, who was shot in 1878, and only a few years ago we took a radiograph of this arm, which shows possibly forty shot in the soft tissues. He has gone along these many years without these shot causing any apparent injury to the tissues. But that is not the same proposition as the placing of gutta-percha in a cavity in bone.

Just one word about radiographs of these cases. We do not know yet how much value to place upon radiographs which show regeneration of bone in cases of alveolar abscess. I think many of us have been too well satisfied with a comparison of radiographs taken previous to treatment, showing a considerable area of bone destruction, and some months after treatment, showing bone built in apparently close about the root end. Dr. Rhein has called our attention to the fact that in some of these cases the bone does not stay built in closely about the root. I have called attention to that fact before this Society: that radiographs taken still later often showed that, after building closely about the root end, the newly built bone would be destroyed, and another radiograph would show a cavity in the bone. I doubt if radiographs are certain enough, unless we have had a good many taken over a period of years, to justify our saying that these cases are safe. We must remember that even though bone is built closely about the end of the root, there will be no attachment to the root. There is a space between which is filled with serum, and this serum is subject to infection by any organisms which may reach the area. Certainly, where there is a question as to the patient's resistance or the physical condition, it is a mistake to permit such teeth to remain in the mouth.

Lastly, I think the one thing, above everything else, which we should all take home as the result of this presentation tonight, is the emphasis which Dr. Rhein has placed on all the various minutiae of the technic. Whether we agree with him or not in the particular technic he uses, we should not do otherwise than agree with him as to the necessity of all care and of all watchfulness of the details, such as have been presented tonight. We should remember in every case that comes to us in which a pulp is involved, that the treatment of the root canal is the most important thing we have to do for that tooth; that there

is no need of trying to do anything else for the tooth if we do not make the best possible filling.

I know we have been delighted and pleased to have had Dr. Rhein present this subject to us.

DR. E. D. COOLIDGE:

There are other men in this audience of more experience by many years than my own that I would rather hear discuss the remarks of Dr. Rhein than to discuss them myself, but since I have been called upon to take part in this discussion, I want to say something that has been in my heart for sometime.

I have great admiration for a man who has a definite idea, who has a purpose, and sticks to it and fights it out, regardless of criticism, regardless of obstacles or difficulties, regardless whether he stands supported or stands alone. Dr. Rhein sticks persistently to his idea which he has reasoned out in a logical manner and he follows it along year after year. His method has been perfected by years of experience and he has given us a beautiful description of it in his remarks and by his lantern slides and moving picture film.

Several years ago, when the idea of radiographing teeth for root canal work began to be agitated, about the time of the meeting of the National Dental Association at Rochester, the idea had been in my mind that it was important, and that the dental practitioner should have an X-ray machine in his office and do radiographic work in every case. I went to Rochester with that idea in mind, though it had not crystallized enough to make me determined to carry it out; but after having seen Dr. Rhein's exhibition at Rochester and heard his talk, I was thoroughly convinced and came back home and began that work in my own office. So it was through Dr. Rhein that I received the inspiration of starting this line of work. I have received further inspiration from him tonight because he is so enthusiastic in his work. Dr. Rhein is a man who believes in his work, and who has a definite ideal to strive toward, and who will accept nothing below that ideal for his result and be satisfied with it.

As he has told you, if the root canal is not perfectly filled when he gets through, he feels it should be extracted and the patient's health conserved, for the heart weighs in the balance so much more than the tooth that the tooth is of little conse-

quence when it comes to the extraction of it to protect the other. I believe he adheres to that principle, and that he aims to get his result or extract the tooth. I admire him for that. Though I may work along different lines, and may disagree with him in some points, and while I strive after a similar result in a different way, the principle is the same. He has a definite technic, and that I think is one of the most important things for us all. Too many times we go at a piece of work without a definite idea of what we are doing, without a clear conception of our work, and work along hit or miss. Dr. Rhein has shown us every step, he has given us something definite for each step, something to be practiced in every case, although as he says, there may be a variance in some cases. The method may be changed a little at times, but there is a definite technic to be followed out in all cases. Unless we do that, uniform results are impossible to obtain.

I like very much the thought that he expressed that we are dealing not only with teeth but with human life. If each one of us would think of that every time we treat a root canal, I am sure it would be an influence to make us more careful; it would be an influence to make us more careful in our sterilization and in our technic. If we could only keep in mind the seriousness of drilling into a tooth that has infected material in it, or closing up a tooth that has not been freed from infected material, which is more serious than an open surface wound, we would have less unfortunate results. There is less chance of a patient recovering from a careless tooth operation where the infection is sealed in the tooth than in a case where the infection is on a surface wound. We should use as much care in the sterilization of our material for root canal operations as is used for any other surgical operation.

I am beginning to agree with Dr. Rhein when he makes the statement that antiseptics and disinfectants are not the most important part of root canal treatment. I believe the mechanical work is more important than the use of drugs in root canal treatment. By thorough curettement, by thoroughly removing the infected part of the tooth, we have done more than we can hope to do with antiseptics and disinfectants in the root canal. No root canal is ready to be filled until it is en-

larged for convenience, until it is enlarged sufficiently to receive the filling material, and unless it is enlarged sufficiently to handle the filling material in a satisfactory way. No one would attempt to fill a cavity with gold or any other material unless he was able to manipulate it in every part of that cavity, if he expected to have a perfect result. There is no logic in assuming that we can fill a root canal around two or three angles and over the wall of a tooth, working backwards to the mesio-buccal canal, or mesial canal of a lower molar through a small opening in the occlusal surface. It is always necessary to gain access to the canals even though it is to sacrifice good tooth structure or a beautiful filling or inlay. The filling or the tooth or the whole crown of the tooth is of little consequence in comparison with the root of the tooth. That is the foundation, and unless that is properly taken care of the rest is useless. We are treating tissue; we are not treating tooth substance in infected cases. We are treating through a tube to get at the infected part of the tissue. We remove the cause of the infection; we remove the original source of the infection, but we must depend upon nature for the recovery of that condition or else extract the tooth.

In case of denuded root ends, where encapsulation might seem to be indicated, I cannot see how the chloro-percha would stick to it close enough to confine the infection beneath, and, it seems to me, it would not seal it if it were free from infection. Oftentimes we have a case with an absorbed area around the end of a root which seems to indicate that it encloses the entire root or it encircles the root, when sometimes the area may not encircle the root, and in that way denude the entire surface of the cementum of the apical end of the root. It may be a cavity which is absorbed slightly in front or slightly back of the root which would appear the same in a radiograph, and yet after the treatment of such a case a perfect result can be obtained and the root would be saved. If the root end were entirely denuded, leaving the whole area of cementum exposed, the chances would be very doubtful as to recovery in that case. Sometimes they heal up beautifully, and in those cases where they heal so perfectly, and remain so, they are cases where the cementum is not denuded as much as it appears to be in the radiograph. There are deceiving things about the radio-

graph and we cannot always tell the extent of the absorption around the root by the radiograph. So in those cases where we are unable to determine that, I think "safety first" is a good motto. I would rather remove a tooth that looked doubtful in a case that was rheumatic or arthritic, than I would take chances on the treatment of it. I do not doubt that the case can be benefited, and Dr. Rhein has shown us convincingly that there is recovery in some cases and his radiographs show a record of improvement. Undoubtedly he has saved the teeth for those patients, which was a valuable service. If there were some way to determine with safety just which teeth could be saved, we might do it in all cases. I would feel more like undertaking these cases where there is no history of rheumatism or arthritis than I would in cases where there is a history of those two diseases.

There are little points in the technic in which I would differ with Dr. Rhein, but I will not take the time on account of the lateness of the hour to mention them. It does not matter so much about the technic if we get the result. The result is what we are after, and if we can get better results by one method than another, we should follow that method.

DR. RHEIN (closing):

I have found it difficult to do more than skim the surface of this subject, and on that account it has been a difficult proposition to handle.

I want to thank both of the gentlemen for the very lenient manner in which they have handled me, knowing both their ability and their natural disposition. (Laughter.) I am so thoroughly imbued with the spirit of this thing that if you ever start me talking again, I would keep you here until breakfast time. For that reason I can only express to you my thanks for the cordial reception you have given me and for the marked attention with which you have listened to my feeble efforts.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held February 5, 1918, with the President, DR. J. H. WOOLLEY, in the Chair.

Dr C. N. Johnson read a paper entitled "Is It Structure or Environment?"

DISCUSSION.

DR. JOHN P. BUCKLEY:

Dr. Johnson has surely answered the question, and to me it seems he has answered it in such a way that he leaves absolutely no room for argument. He is a good deal like (I think it was) Louis Jack, of Philadelphia, who charged pretty good fees for his work. One day a fellow practitioner wanted to know of another one in Philadelphia why it was that Jack could command such large fees, and the reply was "He has the power of saying \$15.00 or \$20.00 in such a way that it leaves absolutely no room for argument on the part of the patient," and that is certainly the way Dr. Johnson has answered the question, "Is It Structure or Environment?"

I had no idea that a group of men as intelligent as I from the outside had supposed the members of this Society were, would have suggested such a subject for discussion, but Dr. Johnson said you had a discussion at a previous meeting as to whether it was structure or environment, and you failed to settle the question, and as a result he has written this paper. I am surprised in this day and age that you men should have an idea that the structure of the tooth had very much at least to do with the progress of decay.

It has been a number of years—nearly 12 or 15—since I gave the subject of chemistry and the decay of the teeth much study. Like Dr. Hinkins, I used to go over it occasionally because it is a beautiful theory—the theory that a plaque can accumulate on the teeth, and that plaque, or gelatinous or mucoid material, can act like a dialyzing membrane beneath which bacteria are held, and these bacteria would die and starve to death were they not fed; but sugar, a soluble substance, comes along, dissolves in the fluids of the mouth, and osmosis or dialyzation takes place through the membrane and thereby feeds the bacteria, and the bacteria being fed splits the sugar up into an acid, and the acid newly formed being in an active condition lies there on the spot, concentrated as it is, not having an opportunity to become diluted with the fluids of the mouth, attacks the tooth structure, and when that process is over the bacteria would die again were it not for the fact of salt being produced, as a result of the action of the bacteria upon the inorganic structure of the tooth, is sol-

uble calcium lactophosphate, and this dissolves in the moisture which is present, passing out again from beneath the plaque. Thus this process, going on and on, causes what is known as tooth decay. I like to go over that theory occasionally and kept it in mind because it is a beautiful chemical theory, and I believe it is correct.

Dr. Hinkins, the late Dr. Cook and myself, a number of years ago, spent one or two nights every week in the laboratory of the Illinois College on the subject of erosion, and we tried to disprove the theory of Dr. Kirk regarding calcium lactophosphate, which appeared through the polariscope as being crystallized in the mouth as a result of some acid acting on the calcium phosphate of the tooth, and we got into a great deal of trouble. If Kirk got as much fun out of this as Hinkins, Cook and I did, he ought to be satisfied, because I know we were.

As I said in the beginning, I have had to wander more or less to say anything, as it seems to me, there was nothing left to discuss in the paper presented by Dr. Johnson.

I might say one thing more suggested to me by the paper, and that brings to my mind an editorial written by Dr. Johnson a month or so ago concerning which I wrote him a letter. In his characteristic way he called attention to the fads of the dentistry, among which was the prophylactic fad, and Dr. Johnson in speaking of prophylaxis to be carried out in the mouths of patients by means of which the prevention of caries can largely be accomplished, has emphasized in that editorial that point, and in his paper tonight he has intimated that it should not be carried to an extreme. I would not permit myself to say that prophylaxis can cause as much harm as caries, but I do not hesitate to say here tonight that prophylaxis, as carried on by some men in this city of ours and other places, is doing a great deal of harm. That it is valuable no one can deny. That we can change by prophylactic measures and prophylactic processes the environment of the teeth, the condition of the mouth, is an assured fact.

DR. J. E. HINKINS:

I am very much pleased to have heard Dr. Johnson's paper. He has rounded it out so beautifully and has spoken of environment and structure being so closely allied, that I do not know how to draw the line of demarcation between the two. It is a

subject of considerable importance today and has been for some time. But when we had a discussion a month or two ago it was largely on the analyses that have been made on all teeth, but it was very largely on qualitative analysis, and not quantitative analysis. I have never seen an analysis of any of the teeth, animal or human, but that it was qualitative and not quantitative. Therefore, it would be utterly impossible to make the statement and try to prove it that the chemical difference in the structure of teeth that we are studying is only qualitative and not quantitative.

We select a number of teeth which seem to us, from a clinical standpoint, to be soft teeth, and we take another bunch of teeth which, from the same standpoint, seem to be harder from the point of view of the enamel, and then make an analysis of the two sets of teeth. This would be a very difficult problem and an exceedingly technical one. When we gather three or four quarts of teeth from the extracting laboratories and clean off the gum tissue and then analyze them for the percentage of calcium phosphate and carbonates and other things, we pay no attention to separating the teeth as to quality or quantity; we only want to find out the percentage of the elements in the teeth. It does not make any difference how diluted or concentrated it is when you start, it goes into one mass and you analyze it to the lowest constituent you can find as an element. If we had to make a quantitative analysis, we would have to go through a different process and take into consideration the laws of averages, which would tell us in a general way the fractional differences in these teeth. Of course, it would not be very marked.

I visited a couple of laboratories and selected about 100 teeth that had been extracted and had been thrown into jars. I took these teeth and put them into a solution of bicarbonate of soda, or similar solution, then took them out, cleaned them, examined them, and they looked like a soft variety of teeth. I then took these teeth to the chemical laboratory of the University of Chicago and went over them. A number of these teeth were children's teeth. We tested them as to their density and specific gravity, and the structure of these teeth averaged up very well with the law of averages as they use it. They said everything differs under different environment.

Dr. Johnson laid so much stress on environment that it is hard to tell where to draw the line of demarcation between structure and environment. If a child is put under proper environment and has got good, rich red blood corpuscles, and plenty of fresh air and sunshine, those things in part go to build up the structure of the teeth and that is part of environment. On the other hand, we know that some children who are poorly fed, poorly nourished, who live in badly ventilated homes have splendid teeth. What kind of environment would you call that? You find good teeth and good tooth structure, so structure and environment are closely allied, making it hard to differentiate between the two.

I said to Dr. Barrows that I would like to take this subject up and make a chemical study of it if I could have the co-operation of their laboratory. They said, all right, you can bring the teeth here and we will do all we can to help you settle this problem; but they said, "where to draw the line between structure and environment of teeth, we do not know. You have to find that out."

DR. P. J. KESTER:

It seems to me, Dr. Johnson has covered the subject very effectually; but Dr. Hinkins' remarks rather puzzle me, because he took the view that the structural condition of the tooth depends upon its environment, which is probably true in a sense. In other words, in healthy, well nourished children's mouths, the probabilities are that the structure of the teeth is much better than those of children who are ill nourished, ill fed, and are not so well cared for.

I have had it in my mind to read a paper which will express to a certain extent my ideas in regard to immunity in decay of teeth. I have believed for a long time that this immunity to decay in the mouth depended more upon the condition of the patient than upon environment. I have thought for a long time that the fluids of the mouth contained within themselves certain morphological elements which controlled the decay of teeth.

DR. JOHNSON:

Is not that environment?

DR. KESTER:

No; that is physiological. Everything is environment.

The air we breathe and our very existence are involved in the question of environment, but I am speaking now of a definite something which renders the teeth immune to decay. In speaking of environment and decay of the teeth in certain mouths, Dr. Johnson mentioned cases where decay is absent in those mouths that are ill kept, that have received little or no care, whereas in the mouths of patients whose general conditions are not above the average particularly, there is no appearance of decay of the teeth, so that in such cases the broad term environment, unless you include natural immunity, does not count.

DR. F. E. ROACH:

I wish Dr. Johnson would explain what he means by environment.

DR. JOHNSON:

The conditions which surround the teeth or tooth, rather than the tooth itself.

DR. ROACH:

The term environment to me may mean a great deal. If we look upon the question of immunity and susceptibility of teeth to take the decay as to whether these conditions are due to the structural makeup and integrity of these teeth, there is to my mind a difference in the chemical composition of the teeth. While the chemical composition of the teeth may not be sufficiently variable to be detected, the vitality or arrangement or integrity of that tooth, due to the inherited structural arrangement of the parts that constitute that tooth, seem to go more towards the resistance to decay or susceptibility to decay than anything else, and not so much upon the immediate surroundings or the environment, as I understand the term environment.

As to whether these teeth are bathed in secretions that are the average normal secretions, or whether these mouths are full of filth and are ill kept or not, we have seen many cases of mouths that had absolutely no care at all, and while their teeth did not look to be particularly strong, they have gone through life without any decay. Of course, it is evident that it is due to something there in the nature of environment, whether you limit the environment to the immediate surrounding conditions, or whether you mean by environment the vital resistance of that individual.

I do not think we know anything more about the reasons or

causes for immunity and susceptibility of nature than we know about erosion. We are just as far at sea as we are about erosions. I do not think we know anything about it.

I am quite satisfied that what little we can do, so far as our immediate tinkering in the way of repair of these teeth and the cleansing of these teeth are concerned, is a mere infinitesimal effort as compared to what can be done, and I was in hopes the other night when Dr. Tinker presented a paper he would go right back to the beginning and tell us to put into the makeup of the individual from the very inception the elements that go to bring about that vital resistance the individual needs and the individual shows, not only to decay of the teeth but of other diseases all through life, and it is that vital resistance we would like to get into these individuals that will make them resistant to caries.

It is amusing to see how various men will look at this question. Dr. Buckley with his chemical mind looks at it from a chemical standpoint and Dr. Hinkins looks at it from the standpoint of heredity and chemistry. Another man likes to believe that these things are brought about through certain chemical changes, and that is a beautiful chemical theory, Dr. Buckley.

DR. BUCKLEY:

It is correct, isn't it?

DR. ROACH:

It is correct as far as chemical theory is concerned. You know, we will never get far along in the eradication of decay until we go away back and find out how to overcome that by the vital resistance of the individual. There is where I think we have to go a long way farther than filling or repairing.

I was in hopes when Dr. Hinkins started out with his study along the lines of his paper, which was presented at a previous meeting, regarding food values, we would learn from him how to feed the mother so that the child would get into its makeup those vital elements of resistance to decay, so that the environment, whether the mouths be well kept or not, would still go with the conditions we see in connection with decay.

We are practicing dentistry to meet and take care of an artificial mode of living. That is my honest conviction in the matter. I do not believe there would be any particular need for dentists if people used their teeth according to the plan of the

creator in the begining. We are called upon to take care of the teeth and mouths of people simply because of the artificial mode of living. That is my idea as to the possibility of dentists meeting this condition of whether it is environment or structure. I am quite in accord with Dr. Johnson if he will extend the term environment to include that inherent vital resistance which the human being is born with and is given to carry through life.

DR. SIDNEY J. KNOWLES:

This paper of Dr. Johnson's, particularly in this day of research work, deals with a subject that stimulates us to think and study more than ever before.

I was a little disappointed that Dr. Hinkins did not bring out the point that he presented in his paper some months ago and on which Dr. Roach has elaborated a little. Referring to the point that we as dentists are taking care of mouths of human beings who have become so civilized that they have developed mentally and suffered physically, I will say that their mouths, in a measure, have gone into a state of degeneration. My understanding is that the man who lived before us, who had well developed jaws and splendid teeth and normal healthy gum tissue, had these conditions because of environment and mode of living; that when he became more civilized and began to cook his food, he changed the material which was taken into his body, and this change brought about digestive disturbances. We also bring these changes about by the manner in which we live. It is not practicable for us to be cave men, but as a result of having been a cave man, let us say, I believe, as Dr. Roach has said, that through this normal way of living the man who lived before us had apparently better development of the teeth than we see today. Apparently, there are comparatively few teeth that are well fused today. It is possible to see in skulls well fused cusps and normal surfaces in these teeth. Whether that is entirely brought about through environment after the teeth have erupted, I personally doubt.

In regard to the teeth of people today not being as well developed as those of their ancestors, environment is probably as great a factor in the destruction of teeth as anything we have; still we have tissue in other parts of the body—tissue tone—which offers less resistance to infection in one individual than the same type of tissue in another person during another time.

In other words, man's physical condition may be so lowered through mental activity that he is subject to infection by the pneumococcus. The structure is exactly the same, but there is something that cannot be measured or seen which is so altered that the body does not offer resistance. Whether that is true of the teeth the same as it is of other parts of the body, is a question. It is true, the bony tissues in some individuals are very different from those in another, particularly in cases of rickets, and so on. I believe that the quality of the bone in one case is different from that in another.

I was of the impression from the paper that certain chemical changes that take place outside of the mouth in the soil can be put in a form so as to be easily assimilated while the teeth are being developed. I was guided in that thought by the deductions drawn by Dr. Gies at the New York meeting of the National Dental Association. He gave the results of some experimental work in which he injected dogs with methylene blue at the time the teeth were developing. When these teeth had erupted the structure of the enamel showed this deposit. In dogs where the teeth had developed the injection of the same material did not show within the enamel. Apparently, one time the methylene blue was taken up by the structure as developed, and in the other it was not. If the enamel has been calcified it has no effect.

As to perfect teeth, I had occasion to look into the mouth of an Indian, 56 years of age, whose environment was not desirable from a clinical aspect. I do not think I ever looked into a dirtier mouth in my life; yet he had never been sick in his life from the condition of his teeth. Those teeth were different in structure from the teeth of a poorly nourished boy brought up in a crowded community of a city. I think there is a difference in structure of the teeth of these two individuals. I also feel that the environment of the mouth in the Indian's case would have probably destroyed all the teeth in the mouth of the boy. Of course, that is theory.

I was very glad that Dr. Johnson in speaking of environment referred to prophylaxis, which is one of the most important subjects before the profession today. I do not believe in thirty day prophylactic treatment. I believe in nature's prophylactic measures. The mouth and gums should receive treatment every

12 hours. If this is done it will offset the changes of environment that we are all confronted with. It is possible for us as dentists to instruct patients intelligently to carry on more perfectly the natural masticating forces. A dog, if he is properly brought up and given proper food, will chew bones, coarse material, and have a mouth that is filled with hard fibrous tissue. If that same dog is brought into the house his mouth will degenerate as a result of light friction. And the same is true of the human mouth. I still think from a few isolated cases that there is a difference, but whether it is measurable or not, I do not know.

Speaking of prophylactic treatment again, if it is true that action has taken place in the mouth, due to the civilized way of living, and the teeth have become roughened, it is reasonable to assume that if these roughened surfaces of the teeth are intelligently polished again, which must be carefully done, they are less liable to decay. However, I don't believe in the radical position that is taken by some. It is quite possible to keep these surfaces polished and remove the source of trouble or change the environment.

Coming back to people who have chosen to be mentally developed and have suffered physically, how shall we meet that problem? I tell them to brush their teeth, and they go home and do so, which means no more than if a physician told us to be careful about our diet. But if a man will lay down certain definite principles to follow in his office, and instruct his patients to the effect that nature intended that people should exercise their mouths and gums and receive friction from the eating of unground foods, and tell them why and how to do these things, they will be in a better position to avoid the ravages of civilization.

DR. TRUMAN W. BROPHY:

I appreciate as thoroughly as any one can the value of this paper. When published it will have a very much larger audience and will set men to thinking on the subject of environment. I believe that correct environment is the most potent factor in preserving the human teeth, yet from my experience with treating teeth I recall certain circumstances which impressed me that environment was not the only influence responsible but that structure has much to do with the preservation of the teeth. I recall an Italian with short, well developed teeth in a firm square

jaw in close contact. The cusps of the molars and bicuspid were short. The bicuspid fissures on the occluding surfaces were very shallow, and the sulci in the molars were shallow also. The alveolar process was broad, and the gums dense and normal. There was no recession of these gums, the teeth were all perfect. I also recall a Swede whose teeth were long, whose alveolar processes were not so broad as those of the Italian. The gums were slightly receding. The fissures in the bicuspid were deep, and the sulci in the molars were also deep. The teeth were not so broad and strong as they were in the case of the Italian. They both came to this country at about the same time. Five years after they arrived here the Italian's teeth were good; they apparently had not changed. He gave little attention to prophylaxis. The Swede gave very little attention to prophylaxis. Five years after the Swede arrived his teeth broke down; the cavities in the molars were deep, and the bicuspid were broken away. The incisor teeth had become carious upon their proximal surfaces, and the man was in a position to soon become edentulous. Was this a matter of environment, or was it a matter of structure? Possibly it was heredity. I think structure in those cases had more to do with the condition of the teeth five years after they arrived than environment because their environment was about the same. I believe very strongly in pedigrees. I believe in strength, health and vigor of the parents. I believe that strong and healthy parents will transmit to a child conditions that will make him more immune from disease than in the case of the child whose parents are not strong and vigorous. Compare, for instance, the offspring of strong, vigorous, healthy parents with the children of parents who are in feeble by tuberculosis or who are possibly luetic. The child of strong and vigorous parents has every element in his structure which will take on the characteristics of his parents. And the same thing holds true very largely of the child born of weak or enfeebled parents, though after all, those same people with proper prophylaxis may go through life with comparatively good teeth. The weak child, or the man born of weak parents, will naturally be weak in every organ as compared with one born of strong parents. I have always thanked God that my parents were healthy, strong and vigorous, and I am sure I would not be here now if that were

not the case because I have been through enough to terminate the life of the average individual.

Regarding prophylaxis, there is altogether too much discussion of this subject in a way that is not correct. I am satisfied that dental prophylaxis as sometimes practiced causes an immense amount of harm. For example, in the last decade there has been innumerable instruments designed for the purpose of working upon the teeth—scalers, if you please. You may call them something else, but that is what they are. Many of these scalers are all right, when properly used, but I am satisfied that a very large percentage of dentists do not know how to use these scalers and they use them with great detriment to the individual upon whom they are employed. I have forgotten the name of the man who gave a stereopticon exhibition here in Chicago in which he exhibited teeth upon which these scalers had been used by an enthusiast for the purpose of treating so called pyorrhea. He used them just as a carpenter would plane a board. He kept planing and planing, and planed these teeth down so far that the cementum was half cut away, and the patient was left in misery. He suffered intense pain for months by reason of the fact that the dentist had not judgment good enough to dictate to him that he should not take off any more than deposits. But the dentist felt it was his duty not only to take off deposits but to scrape the teeth, the cementum, and the organic matter of the cement was exposed to irritation, and the suffering he experienced was so intense that he laid awake at nights.

To have attempted to cauterize the surfaces would have been destructive to the gum tissues, and so this patient was allowed to go on suffering until nature after a year or two came to his relief and partially, but not wholly, relieved him by deposits or closing of the open spaces of the canaliculi of the cement. That is not prophylaxis. It is incorrect practice. If we could do something to prevent that excessive misdirected effort on the part of well meaning men who feel that they are doing the right thing to scrape teeth like that, we will have done a great work.

Lastly, prophylaxis, after all, is the most important of all considerations regarding the preservation of teeth, as I have

tried to point out in comparing the condition of the teeth of the Italian and those of the Swede.

DR. L. L. DAVIS:

Dr. Johnson has so carefully covered up his tracks that I can really sympathize with Dr. Buckley that he should have been called upon first to open the discussion on this subject, because Dr. Johnson has his paper so beautifully worded and so nicely arranged that it was impossible for the first man to pick any flaw in it, and if Dr. Buckley had been called upon last I think he would have changed his mind.

We went over this argument once before, and Dr. Johnson has had a good chance to incorporate every argument that was brought forth, and he has arranged everything in such a way that every part of it is right, and he is right. However, there are other ways of looking at this subject. There is not a thing that Dr. Johnson has said that can be gainsaid; at the same time, where are we going to stop with environment, and where are we going to begin with structure?

When Dr. Hinkins read his paper I brought up the question of heredity. Dr. Brophy has already referred to that. Heredity plays a greater part than anything else in the whole human economy. If you have got good parents, good ancestors, and forefathers, I don't care what the conditions are under which you were born. You may be born in a gutter and things will be all right. There must be something in structure. What is it? We don't know. Chemistry has not evolved it yet, but we do know this thing about chemistry, that there are certain carbon elements that have almost exactly the same chemical formula, but with the slightest change in the rearrangement, which modifies entirely the texture or the condition of the substance that is evolved, a change is brought about. Now then, if by any means we can place into the mother's system substances that will improve bone tissue that may be poor in structure, so that the mother's life blood will render these substances available for the embryo and bring about better conditions than there appear in the mother, the chances are that the child will have a better structure than the mother had. And so I say, if we at the present time can only evolve some method that will improve the

structure in the parent, we will have accomplished a great deal. This whole matter was started by the paper of Dr. Hinkins on food values. I am in hopes that at the May meeting of the Illinois State Dental Society at Bloomington we will have a paper by an authority along the line of food values. We are promised a paper of that kind. It is one of the things I am striving for, and if I get it, I think we will have something that will be worth taking a trip from Chicago to Bloomington to hear it. There is something in structure. Sometimes, when a person is in a condition of ill health, has colitis, or inflammation of the lower part of the intestinal tract, he will have a reflex action within the mouth. He will have a different condition of the secretions. That is environment as we speak of it and as Dr. Johnson speaks of it, and that kind of environment is going to produce its effects, I don't care what the structure of the teeth may be. If we go back to first principles and take a person who is born from poor parents, with a tendency to this or that or the other thing in the shape of physical weakness, and then if that person should have this disturbed condition, whatever it may be, his teeth will break down and become decayed more rapidly than they would in the mouth of a person who comes from good parents, with good bodily condition naturally. It is exactly the same condition that occurs as far as physical elements go with the same environment, and also as far as the teeth are concerned, and yet in the two individuals we will have a different condition. One will resist decay of the teeth and the other will not. Whether it is due to a difference in hardness or softness of the tooth structure I do not know. But there is some molecular or chemical arrangement of the tooth tissues by which one will resist the action of decay far greater than the other. That is the sum and substance of the whole argument.

As far as prophylaxis is concerned, we all know that where such conditions as I have mentioned in regard to bodily health are concerned, if that person will take fairly good prophylactic care of his mouth he can fight the ravages of decay to a certain extent. So that is another argument in favor of environment. Everything Dr. Johnson has said is right, but the question is, how far are we going back of environment, and where are we going to draw the line on structure?

DR. J. G. REID:

I was in hopes that this thing would be settled before I was called upon to discuss the paper. I have heard excellent arguments tonight on this subject pro and con, but am left in the same position that I was before there was any argument advanced on the subject.

I have passed through a period in the practice of dentistry where I thought I might see some things I could rely upon; then I came across other things that knocked my theories to one side, and now I have come to the question of structure and environment. There is not a man present who could not cite instances in his own practice covering a period of a number of years which would enable him to present the most favorable argument upon either side of this question, and as I sum it up, it is about six to one and half a dozen to the other. I think a great deal depends upon structure, and a whole lot depends upon environment. I could illustrate this by a case that I have had under observation for the last two or three years of a young lady who has been my patient from childhood. I took care of her first molars. She came to me when she was six years of age. She is forty or more years of age, and that woman had as beautiful a set of teeth up to five years ago as any one would want to look at, and in the past three years I have had my troubles in caring for her. Her teeth have gone to pieces. Her care of these teeth has been just as diligent up to the present time as it ever was in her life, and if anybody ever took care of their teeth she did, and she had a beautiful set of teeth by so doing. She has appeared in public occasionally, and for the past five years she has bumped up against many things that would kill other people. She has lost her parents, brothers, sisters, has sustained financial losses—in fact, almost everything that you can think of within the past five years, and during this period her teeth have gone to pieces. Now, I suppose that was environment and it undoubtedly was. There is no question about it. There has been a physical destruction, a lowering of vitality evidently of some kind. I do not know what it is. She seems active. She seems to bear these burdens with the greatest fortitude. You would not notice it in her, and yet when she tells you of her troubles you must know that

she has undergone a severe and intense mental strain, as well as physical strain.

I do not suppose there is a member present who does not know of the case of Dr. Crouse. There was an instance where the same conditions prevailed. Dr. Crouse had splendid teeth, and yet through the great loss he had sustained in the latter years of his life his teeth went to pieces. What is it? The structure of these teeth was perfect. The inheritance was good in both instances. I can recall not only this particular case, but I could cite a number of similar instances, but this is the most marked one that has ever come under my observation. It only goes to show that a beautiful structure can be brought to destruction by certain conditions, and those conditions are manifested through all our lives individually. There is something that is constantly interfering with the laws of nature somewhere and at some time. We go to pieces in two or three years, and then revive again. We are able to overcome certain conditions. We are restored or regenerated. Normal conditions are brought about. I believe as Dr. Roach and Dr. Brophy have stated, in a large family there will be some member of it who has got to suffer, but even in a large family its members do not all have the same conditions. It is difficult to draw the line between environment and structure. This paper is going to set a great many people thinking. The author has given us some thoughts and ideas that will stimulate us to pursue this subject with considerable interest in the future. It is an old subject newly revived. It is timely.

DR. J. H. WOOLLEY:

The question that has been raised by the essayist, namely, is it environment or tooth structure? is a very important one, and Dr. Davis has really made my speech when he said that he believes inheritance or heredity is one of the greatest factors in settling the question.

A number of years ago, when I was interested in this subject of tooth structure and environment, after having read a good deal about it, I experimented a little on one of my patients. As she was pregnant I induced her to take up the study of hygiene and to prepare herself for the development of the child in utero, using food of the proper kind that would develop bone substance

and proper structure for the teeth of the child, so that when the child needed the services of a dentist for the second teeth there would be less trouble with them than in the average cases, and yet in this particular instance I never saw worse teeth than this child had.

DR. JOHNSON (closing):

There are a great many things to be said yet, notwithstanding the discussion we have had. In the first place, I am utterly amazed that there are so many who cannot draw the line between structure and environment, particularly men of the caliber who sit around this table. There is as much difference between what is meant by structure and what is meant by environment as there is between the color of black and white.

DR. KESTER:

Has not environment a great deal to do with structure?

DR. JOHNSON:

Certainly it has. I have been making that argument. By structure we mean the physical makeup of the teeth—the teeth themselves; by environment we mean influences which surround the teeth.

With reference to the remarks made by Dr. Hinkins, I was not saying anything in regard to quantitative and qualitative analysis of the teeth. That has nothing to do with the question raised in the paper; nor did I refer in particular to artificial modes of living.

I want to call your attention to the fact that dental decay is not a modern disease. We have evidences of the awful ravages of dental decay among the skulls of Egyptian mummies, and so dental decay is not a modern disease by any means. It may be more prevalent today than ever, but the savages themselves had a great deal of decay of the teeth. I have the model of the mouth of an aboriginal of Australia, and he is supposed to be the lowest type of all human beings. His mouth was very large, with teeth that you would describe as being of such perfect structure. These teeth were broad. The incisors were almost as broad as ordinary molars; the jaw is very much larger than the average human jaw in a white person, and yet that model shows the ravages of decay rampant over that mouth from that old aboriginal, and I feel sure it was due to environ-

ment. There was a case where, if structure was ever well laid down in a mouth, it was in that mouth.

I shall not attempt to cover all of the points that I have outlined, but I am going to refer briefly to some of the remarks that have been made in connection with the cases of caries. That is the most significant thing that has been said in the discussion. In following the clinical histories of patients we often see these manifestation arising in a patient who is susceptible to decay for a time during youth. Youth is quite a susceptible period for dental decay. We also have senile decay, but decay of the teeth in youth is the most prevalent of any. You have all observed this fact: if you take a boy or a girl in whose mouth decay is going on extensively, you can take that mouth and by giving it proper dental attention, although our reparative processes are merely makeshifts, with the co-operation of the patient, you will find this, if you watch that case that has been susceptible, the decay will pass away in a few years and you will have a definite period of practical immunity that you did not have before in that mouth. You may refill teeth that you had previously filled; you may find recurrence of the decay, but the tendency for beginning of decay has passed away from that mouth practically. Something may change the mode of living in that individual and you may find a recurrence of susceptibility.

Dr. Brophy cited two cases, one in a Swede and the other in an Italian. As I understood from his description, the mouths were practically immune from caries when these individuals came to this country. After five years in one case the teeth began to decay rapidly, and in the other they did not. I want to raise the question, was that change in susceptibility due to a change in the tooth structure, or was it due to a change in environment from different mode of living? I should answer that it was due to a change of environment, from the mode of living, which changed the secretions in the mouth, and the tooth tissue did not change a particle until broken down by decay.

DR. REID:

They lived the same kind of life here.

DR. JOHNSON:

They did not live the same kind of life here that they did in Sweden and in Italy.

DR. BROPHY:

Coming to this country as they did they left the environment they had at home and took on the environment of this country, and in one case we have decay of the teeth and in the other not. Why?

DR. JOHNSON:

There may have been a greater change in environment in one instance than in the other.

DR. BUCKLEY:

The Swede took on American environment more so than the Italian did.

DR. JOHNSON:

Let me carry this a little farther. The case mentioned by Dr. Reid we all know about. Dr. Buckley cared for that case. Let us take another instance. You may take a board-of-trade man, carry his teeth along and keep them under good control for a considerable time, but let a panic come that lasts for months and the nervous tension of that individual is such that within six months or less the teeth will begin to go to pieces. Is that due to a change in the structure of the teeth? Has something been taken from the teeth by the circulation that has made them less resistant than before to decay, or is it because a change has taken place in the condition of the environment? It is a change in the environment, but not of the tooth structure. The tooth structure is not built up and torn down in the physiological processes of nature as are other tissues of the body. Take another instance of a pregnant woman. That point has been mentioned tonight. When I was a student we were taught to believe that it was almost inevitable that when a woman became pregnant and began to raise children her teeth would inevitably go to pieces. I was taught that as a student and I respected my teachers. I was taught that it was due to the fact that the lime salts were taken from the mother to build up the teeth and bony system of the baby. That is the most fallacious doctrine ever taught. It has been disproved time and again. We do not see the same percentages of mothers losing their teeth during pregnancy today that we did 25 years ago. If you will observe that, you will find there is not the same tendency today that there was then. We, as dentists, do not dread the period of pregnancy

as we did in those days. Is that because the teeth of the mother today are changed and built up more strongly for that process than they were 25 years ago? Not by any means. It is due to the fact that we take better care of their mouths. Medical men and nurses have learned that. The trained nurse now carries out oral hygiene among pregnant women, preventing them from having ravages of dental decay. It is the condition in the mouth surrounding the teeth that has been looked after by the physician and nurse.

DR. REID:

There is a physical change in the system of the woman.

DR. JOHNSON:

That may be true, but I am talking about the distinction between the tooth tissue and the conditions which surround it. We can surely draw the line between the tooth structure and the conditions which surround the teeth. I am asking whether it was the tooth structure that underwent a change or was it the conditions which surround the teeth? In other words, is it structure or environment? That is an important question in the relations in which I have stated it. If it is a matter of structure you and I are helpless because when the teeth are once laid down in the jaw you cannot change the constituents of those teeth. You may dope a patient all you wish with lime salts, but you cannot change the inherent structure of the teeth.

DR. KESTER:

I did not suppose there was any argument on that point at all. I don't know that any one claims that the tooth itself has changed structure, but the tooth as it was built up originally was deficient in structure.

DR. JOHNSON:

If it is a matter of tooth structure, how do you account for the manifestations we have been talking about? These teeth must change in structure, or it is a matter of environment.

DR. KESTER:

It is a matter of environment.

DR. JOHNSON:

You acknowledge then it is a matter of environment. I have studied the mouths of patients carefully and by paying attention to the conditions which surround the teeth and keeping them in as nearly normal condition as possible we can accomplish a great deal. Filling the cavities of these teeth is only an incident in the management of these cases. By attending to the reparative work and instituting prophylactic measures in conjunction with the patient I have been able to bring about a condition of immunity years earlier than I otherwise could have done. If we admit that it is a matter of structure of the teeth, we are perfectly helpless in fighting this disease. This is an important matter for us to study. I want you to have clearly in your minds the distinction between the structure we are talking about and environment because there is a line of demarcation between the two. It gives a different point of view in one instance from the other. Most of you will remember the time when patients got the impression that their teeth were so soft that they could not be filled with gold. I have had patients say to me, "My teeth are too soft to be filled with gold," and many a patient has given decayed teeth up and condemned them on account of this false theory taught, in the first place, by the dentist. A dentist is not doing his duty when he promulgates that kind of doctrine. Such a doctrine is accountable for the loss of more teeth, perhaps, than any other theory.

There is a great possibility in taking hold of these cases as they come to us and studying the conditions surrounding the teeth, rather than the structure itself. As I have said, filling the cavities of the teeth is a mere incident, but of course it is a very important incident.



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Devoted to the Advancement of Dental Science,

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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GHOULS.

Ghouls are not all of the graveyard kind. There are some in this very profession of ours, and they are going around in daylight gleefully assassinating characters and trying to tear down reputations. They are not constructive in any sense. They do not create—they destroy. When they criticise, it is not for the purpose of helping but of hurting. They aim to undermine instead of uplift. They enjoy nothing half so much as to see someone's downfall. If a man succeeds in professional life they are suspicious of him at once and they "go after him." It is nothing in their eyes that he has made a hundred successes—the moment he makes a failure they pounce on him like a hungry pack. No matter how hard he tries to do what seems to him his bounden duty, they search with eagle eye for the weak spots and turn the magnifying glass of their derision upon them. They gloat over other people's errors.

A favorite pastime of the species is to secure by hook or crook a piece of faulty work from the hands of a fellow dentist, and exhibit it gleefully among their friends as a "horrible example." A bridge, the bands of which do not fit the roots properly, is a rare "find" for them, and they carry it around in their dirty pockets for months showing it on every occasion. An ill-fitting crown, an inlay with faulty margins, a gold filling that is not well condensed, or an amalgam that has no form to it are all prize packages to them.

Little do they care that the dentist who did the work probably did the very best he could at the time, and under the most

adverse circumstances. No one knows when he sees an operation the conditions under which it was performed, and no one has a right to criticise till he does know the conditions. In many cases these very crowns and fillings have done service for years before they fell into the hands of the ghouls but this counts for naught in the capacious maws of the maligners.

Age, service or previous condition means nothing to them. They are out to crucify, and they have no compunction.

If their methods tended to stimulate men to do better work there would be some compensation, but that is not the purpose for which they pursue their victims. They are sheer iconoclasts—tearing down continually, and never building up. A kindly, helpful criticism is a tonic to a man who wants to do better, and it is always welcomed by the earnest seeker after truth; but the scurrilous, back-biting sting of the viper who lies in wait in the dark places does no one good and harms everybody. There is a moral slant to the man who revels in the discomfiture of his fellows and who is always dilating on their mistakes. His vision is blurred and he loses much of the real joy of life. To him there never comes the sweet solace of having helped humanity to higher and better things, and in the end he usually goes down to disappointment and despair.

The business of being a ghoul is not a pleasant or profitable one, and we recommend to every man who has given himself over to the practices herein outlined to sit down and quietly think on the ultimate effect of his folly, and see if he finds that it pays. Let him dig from his heart the censure that has grown there, and plant in its place the blossoms of charity and loving kindness, to the end that he may help to sweeten the lives of his fellowman, and thereby most surely sweeten his own.



THE EDITOR'S DESK.

THE STRESS OF THE TIMES.

No one can be said to be perfectly normal in these days. The stress of the times is sinking into the hearts of all of us—some more, some less. No man is going about his daily duties in quite the same way as formerly. Every one is affected in some degree by the gigantic forces that are at work to make or mar the universe, and everyone realizes that there is an enormous issue at stake. There is a mental stress connected with the situation that affects us even physically, and it is therefore necessary for us to take better care of ourselves than ordinarily if we are to maintain our full efficiency, and be at all times prepared for the emergencies which may arise at any moment.

Periods of stress affect different individuals differently. With some they tend to bring about an added seriousness of purpose and a deeper devotion to duty; with others they seem to loosen up the moral bonds and lead to licentiousness and irresponsibility. There are at the same time higher ideals on the one hand, and greater depravity on the other. No one can say that he thinks and acts precisely as he did before. It is always said of individuals that they are constantly growing better or worse—that they never stand still—and this is more emphatically true at times like these.

One thing that conscientious people must guard against is that they do not permit themselves to worry over the situation to the extent of incapacitating them for the proper performance of their daily duties. It is hard of course not to be anxious at times and not to conjecture over results, but the fundamental thing to remember is this that every man must do his full duty to the extent of his ability, and when this is done he can add not one jot or tittle to his effectiveness by worrying. This holds true of all the affairs of life, and it is especially true of the affairs of the present.

It is a time now when every ounce of energy is needed, and every bit of resourcefulness on the part of our citizens. No one can afford to waste nerve force by riotous living any more than he can afford to waste money or food. Wastefulness is criminal

at any time, but at the present it is hideous in its criminality. Now is the time when we need more sobriety and seriousness, and a deeper consecration to duty. We have no place for depression or discouragement, and should not admit them into our consciences. With our faces ever turned toward the light we should preserve our souls in patience and perseverance, and live each day as if on the manner of our living depended the regeneration of the world. If we do this the stress of the times will result only in making of us better men and better women.

PRACTICAL HINTS.

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Prevent Nausea in Impression Taking:—Paint the soft palate with the following solution: Cocain hydrochlorid, 0.25; menthol, 0.10; phenol, 1.00; distilled water, 50.00.—*M. A. Horwitz, Chicago.*

To Clean:—Fountain cuspidor or other office glassware which becomes coated with a white deposit from hard water, a few drops of nitric acid will dissolve the coating and leave the glass sparkling and bright. The acid may be easily applied with a pellet of cotton held in tweezers.—*J. A. Wright, Chicago.*

Vinegar for Softening Plaster of Paris:—Vinegar, having the property of disintegrating plaster, may be employed in the laboratory for removing plaster from flasks, by immersing for a few seconds only; for removing casts from articulator by applying over bows only; cleaning impression trays, etc.—*Lester N. Roubert, Chicago.*

Application to Cavity:—I would like to add a word to Homer Almon's hint in the March DENTAL REVIEW. For years my last application to a cavity to be filled with gutta percha is oil of

cajuput. It is a solvent for gutta percha, and it results in a stronger adhesion of the gutta percha to the walls of the cavity.—*F. C. Noyes, Jacksonville, Ill.*

A Good Mouth Lamp:—A pocket searchlight with a long stem light similar to a Cameron light placed in it gives a very effective light for examination of the teeth where there is no electricity or where the dentist has no better light. It costs but a trifle. It is also very effective for carrying in a case for a house examination.—*G. H. Henderson, Chicago.*

To Sterilize Dentin:—Before inserting a filling or cement base in a tooth in which the pulp is alive, evaporate a 15 per cent solution of thymol in alcohol in the cavity. The thymol will penetrate the tubuli and sterilize the dentin. This will avoid irritation to the pulp, which may cause secondary dentin, pulp nodules, or even death to the pulp.—*A. de Vries, Chicago.*

Painful Sockets:—Dentalone—A Parke Davis preparation containing chloretone and essential oils, is not only an excellent remedy for odontalgia but is also very efficacious in immediately relieving pain following extraction. All blood clots should be removed and the socket made perfectly dry before inserting the pellet of cotton moistened with Dentalone.—*Earle H. Thomas, Chicago, Ill.*

Dentin:—I never expose freshly cut dentin to the fluids of the mouth when I can help it, and whether I do or do not I treat it to a touch of oil of cloves. Treating the cavity with alcohol followed by oil of cloves warmed with a puff of hot air from your chip blower, and the cavity stopped with gutta percha until the patient returns, will prevent the sensitiveness sometimes complained of after setting an inlay. Not only that, pulps are not so likely to die.—*Homer Almon.*

Handy Instruments for Removing Gutta Percha:—It is unnecessary to heat an instrument to remove gutta percha from a cavity. Take an explorer that has been broken off and reshape it.

This will make an instrument three or four times heavier, and short and stocky. The temper can be restored very easily by heating the instrument to a cherry red and immersing it quickly in moderately warm water. Then with a sandpaper disk the point may be polished.—Y. E. Whitmore, Little Rock, Ark.

MEMORANDA.

PSI OMEGA FRATERNITY.

Psi Omega Fraternity National Alumni Chapter Chicago, Monday, August 5th, 1918.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board for the examination of applicants will be held at Iowa City, Ia., commencing June 3rd at 9:00 A. M. For further information address the secretary, Dr. J. A. West, 417 Utica Bldg., Des Moines, Iowa.

THE AMERICAN SOCIETY OF ORTHODONTISTS.

The eighteenth annual meeting of the American Society of Orthodontists will be held August 1, 2 and 3, at the Edgewater Beach Hotel, Chicago, Ill. This will be an excellent meeting. It is advisable to make your reservations early. F. M. Casto, Secretary-Treasurer, Rose Building, Cleveland, O.

NEW QUARTERS IN PHILADELPHIA FOR THE S. S. WHITE DENTAL MFG. CO.

After occupying the premises at Chestnut and Twelfth streets since 1868, The S. S. White Dental Mfg. Co. moved March 1, 1918, to 211 South Twelfth street, Philadelphia. The DENTAL REVIEW extends its greetings, and expresses the hope that the Company may find the new quarters in every way satisfactory.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The next annual meeting of the National Association of Dental Faculties will be held in the Green room of the Congress Hotel, Chicago, Ill., August second, at noon. The Executive Committee will meet at ten A. M. on the second. The meeting will continue through August third. Charles Channing Allen, Secretary, N. W. corner Tenth and Troost, Kansas City, Mo., c/o K. C. Dental Col.

NEARLY HALF A CENTURY AGO.

At the Saratoga meeting of the National Dental Association in August, 1869, the late Dr. W. H. Morgan of Nashville, made the statement that he had often tried, but it was doubtful if he ever did clean a set of teeth fairly. "It was often talked of but seldom accomplished." And this still holds true—it is more often talked of than accomplished. But the encouraging thing is that the necessity for cleanliness is being emphasized more and more.

STATE OF WASHINGTON, BOARD OF DENTAL EXAMINERS.

Washington State Board of Dental Examiners will hold their next meeting at Seattle, Wash., May 30th to June 5th. Address all communications to Frank B. Lynott, Secretary, 249 Peyton Bldg., Spokane, Wash.

The Washington State Dental Society will hold its next meeting in Spokane, Wash., June 27, 28, 29th, A. Starke Oliver, Pres.

PREPAREDNESS LEAGUE NEWS AND NOTES.

COMMUNICATION FROM THE PRESIDENT.

OUR NEXT MOVE.

We do not want members of the League to get the idea that the great drive now going on to help make our National Army dentally fit, is the sole object of our organization. It is but one of a series of our activities. The development of our Dental Motor Car is a signal illustration of the great possibilities before us.

Those of us who are not commissioned and continue in civil practice must devote our energies to prepare to give expert services to our soldiers who have been injured in battle. We will find ourselves in need of all the skill we can summon, therefore, I would impress upon our members the great advantage of forming sectional units of the League throughout the whole country for the study of war oral and dental surgery. We are proud to say that our Dental Reserve is over-filled and service in that direction is amply provided for. However, if later on more are needed, the study course will the better prepare us. I, therefore, strongly urge the promotion of this object and point with pride to the splendid record the League has already made in that direction. More than one hundred sectional units have given such a course which has been the means of assisting several hundred to pass examinations to the Reserve Corps, as well as promoting their advancement to higher commissions and positions in the service.

"Knowledge is Power" and is the best weapon at our command to overcome the results of disaster. It is our duty to marshal our forces as rapidly as possible for this object, as already our boys are beginning to return sadly in need of our best service and the great battle which has been fought will bring thousands upon thousands to whom we must minister. Every dentist, whether or not a member of the League, should make this a personal matter and if not near a League Unit, interest himself in forming one in his neighborhood and we will gladly supply all information and give the needed assistance.

Awaken to this call and put your shoulder to the wheel, otherwise you may realize later that you have not done all you might have done for your country. By communicating with the office of the President, 131 Allen street, Buffalo, N. Y., we will give you full instruction as to the procedure.

LECTURE AND SLIDES.

The League has prepared a synopsis lecture accompanied by slides showing cases of plastic and oral surgery before and after treatment; a series covering our free dental activities and a third, showing our new Dental Motor Car.

Twenty-five sets have been distributed to different State Directors for use by Sectional Units of the League and all other societies. We urge their use at State society meetings. The laity, also, will be interested. Assignments may be made by your State Director or through the office of the President, 131 Allen street, Buffalo, N. Y.

IMPORTANT NOTICE.

It has come to the attention of the President of the League that a pamphlet is being circulated advising our members to charge selective service men who are able to pay, for the service necessary to make them dentally fit.

This pamphlet is *SPURIOUS* and the originators deserve no better treatment than internment during the war as cohorts of the Kaiser. It is but another vain attempt to abort the principles upon which the League is founded and which will live for ages after the perpetrators of this un-American and despicable subterfuge have become naught but a blotch of mold upon our fair soil and the unfairly acquired gain has been dissipated without benefit to themselves or their families.

I trust all loyal dentists will exert themselves to give this stigma the lie by strictly adhering to the only principle that can make our organization live and be of vital importance to humanity and our country in this great crisis.

March 29, 1898.

J. W. BEACH, President.

LETTER TO THE STATE DIRECTORS.

I try from time to time to visualize what you are doing, and how the work is going in your State, and can only judge of the operations performed, by the reports received at Headquarters and by the letter received from you and others in your State.

We are glad to have you write often and keep us posted on League matters in your State, as it gives both help and encouragement at Headquarters.

We shall also try to keep you posted as to how League matters at large are progressing for your interest.

I would advise that you occasionally send a letter of encouragement to each of your County Directors. It will keep them in closer touch with you, and they are apt to take a greater interest in their work.

The League has a membership of 13,600 to date. This number should be increased to 30,000 members at once. Ask your County Directors to endeavor to get every member to enlist at least one more member.

The United States now has more than 1,500,000 men under arms, and up to date we have records of work done by the League, of approximately 200,000 operations, but if each had done his part, this number would have been doubled. Some individual members have performed as many as 150 operations; others (new members), none at all, as they have not yet had the opportunity.

Our organization should perform 1,000,000 operations for the men of the next draft.

It is important to keep before the minds of all members, the fact that we should devote our energies almost entirely to men qualified for general military service. These are the men who will do the actual fighting and who must live in the trenches, and who, consequently, are more subject to sickness and infection.

There seems to be a general misunderstanding on the part of some as to what the dental requirements are to fit a man for "General Military Service." He must have six opposing incisors and six opposing masticating teeth (either bicuspid or molars). These bicuspid or molars may be all on one side or part on each side, but there must be at least three above and three below, each of which must touch some tooth on the opposite jaw.

The most important thing to do for these men is to rid their mouths of bad roots and infected teeth, or any tooth having a history of periodical abscess.

After the mouths are freed from infection and the gums healed, plates can be made by members of the League who desire to do so, or they can be made after reaching the cantonments, if the officer in charge deems it necessary.

The mouths, however, must *first* be made free from infection. Then, if possible, any large cavities in the remaining teeth should be filled and the teeth cleaned.

The lack of the minimum number of teeth (six and six) does not excuse any man from *military* service, but only from "General Military Service."

The man who has less teeth than the minimum required for *general* military service can be accepted (if otherwise fit) for limited military service, even if he has *no* teeth.

These men for limited military service will cook food, drive wagons and auto trucks, carry supplies, work in factories, shops or storehouses, etc.

WORK AT HEADQUARTERS.

Perhaps you wonder sometimes what is being done at Headquarters, and I feel sure you will be interested to know.

A resumé of some of the things done here between January 18, 1918, and this date, will give you an idea of the work and expense involved.

Some time during that period you received an envelope containing the following literature:

1. Letter from Dr. Ash.
2. Letter from Lt. Heckard.
3. Membership Application Blank.
4. Questionnaire.
5. Chart of Organization.

These, with the envelope, made a total of six pieces, and one of these was sent to every dentist in the United States—48,664 in all. Multiply that by six, and you have 291,984 separate pieces.

These 48,664 envelopes had to be addressed. It took two girls and an addressograph machine three days to accomplish this.

It took twenty-six girls a week to collate and fold, insert, seal, and classify this batch.

They were classified by states, and those for the most distant points mailed first, and those for New York last, so that they would all reach their destinations about the same time. This method as far as possible is followed in all of the mailing from Headquarters.

One of the pictures enclosed herewith shows the addressograph, addressing 51,135 Form 1 cards (after adding Porto Rico and Alaska to our list). These required six days to address, being a little more difficult to handle because of it being a double card.

Another picture shows a stack of boxes containing about one million pieces, Form Cards of various kinds, which are ready for shipment.

This, however, only gives you a vague idea of what has been done, because we have had as many as thirty-five people at one time working to get letters, cards, etc., out quickly.

Of the Form 3C card, there were sent out within this time 261,000 without the return address and 123,000 with the return address—a total of 384,900.

There were sent out, of Form 18, 63,110; of stickers, 729,610; certified charts, 4,630; plain and franked envelopes, and stationery to State Directors, 32,050; large maps on League work, and charts showing plan of organization, 106; Letter on Organization by Dr. Ash (7 pages), 424 copies, making 2,968 pages; Instruction message of Lt. Heckard (7 pages), 600 copies, making 4,242 pages; Hammond Railroad Map to as many of the Directors as we were able to procure maps for, showing railroad lines, etc, 39.

We have also sent out to new members about 7,800 League buttons. Each button was accompanied by an acknowledgment slip, and another application blank with a request for a new member.

The foregoing, together with daily correspondence and miscellaneous business, has kept us fairly busy.

In addition to this, we are preparing some lantern slides which will be added to others being made by Dr. Beach. This series of slides will be made up in the form of a story or lecture, and probably twenty-five sets will be made and sent to various State Directors, for use in their State by County Directors, and then passed on. It is hoped this will arouse enthusiasm, and make every man not only willing, but eager to do his bit.

Some of the States are organized to a man. Oklahoma, for instance, has more dentists who are members of the League, by four, than are found in our latest list of registered dentists in that State.

Forty States are sending in report cards. From eight States we have received no report cards. The States which make the best showing are those which take the cards and follow instructions sent out from Headquarters.

Much time and thought has been expended on the questions as to how best to handle this work, and the message of instruction as to procedure is the result of this time and thought, and these instructions should be followed.

All Form 3C cards should be mailed by dental operator to National Headquarters, 50 East 42nd Street, New York City, and all Form 18 cards to headquarters of State Director.

CHAS. F. ASH,

March 29, 1918.

Director General of the United States.

FOUR STATES POST GRADUATE DENTAL MEETING.

Dear Doctor:

From the way applications are coming in for membership in the Four States Post Graduate Dental Meeting, those who procrastinate will certainly lose out. From present indications the membership limit will be over subscribed long before the time set. Membership cards will be issued in the order in which requests are received by mail. Please note the following: Place of meeting—New Orleans. Date of General Meeting—June 3, 4, 5, 6. Date of Special Courses—June 7, 8. Membership limited to 350. Membership cards will be issued only to members in good standing of their State Society. Last day for Registration—May 27. Fee, General Meeting—\$10.00 per member. Fee, Special Courses—\$15.00 per member. No one will be issued a special course card unless registered for General Meeting.

Owing to the fact that our Registrar, Dr. C. V. Vignes, has been commissioned in the Dental Reserve Corps, and is subject to the call of the Government, Dr. L. C. Dempsey, the General Secretary, 943 Jackson avenue, will receive all applications and issue membership cards.

The subjects selected to be taught at this meeting and instructors positively engaged are as follows: Dr. Arthur E. Smith, "Conductive Anaesthesia," which will include all Dr. Smith's latest methods, for the various uses of conductive anaesthesia. Dr. Elmer S. Best, "Technique of Root Canal Preparation, Treatment and Filling." Dr. Rupert E. Hall, Chicago, "Full Upper and Lower Dentures." Exodontia will be taught by someone of national repute—instructor not as yet definitely selected.

It will be well to note here that the Four States Post Graduate Dental Meeting of Alabama, Mississippi, Texas and Louisiana is quite different from the various so-called post-graduate meetings held in other parts of the country. At this meeting we offer a general course in which the four subjects are taught in detail by illustrated lectures and clinics to every member, in a general way. At the end of the four days' meeting, after you have heard each instructor and decided upon which subject you would like to get special personal instructions in, you can join that particular class by paying the special course fee. This course will take two days—June 7 and 8. The committee in charge has made it a special feature to engage no instructor for this meeting who has recently given his subject in the south, or who expected to do so before the time of our meeting. Hotel Grunewald, the headquarters for this meeting has made special rates for the members of this meeting and their families. Rooms with private bath—one person \$3.00 to \$4.00 per day. Rooms with private bath—two persons \$4.00 to \$5.00 per day. Rooms with detached bath—one person \$1.00 to \$1.50 per day. Rooms with detached bath—two persons \$2.00 to \$2.50 per day.

Remember, procrastination is the thief of time; now is the opportune time; get busy.

Yours truly,

J. P. WAHL,

Chairman Publicity Committee,
Four States Post Graduate Dental Meeting.

PATENTS OF INTERESTS TO DENTISTS.

1163196. Dental pliers, Edward H. Angle, New London, Conn.
1163197. Orthodontia appliance, Edward H. Angle, New London, Conn.
1162970. Dental grinding wheel and mandrel therefor, Edgar P. Binford, Chicago, Ill.
1163319. Fountain tooth-brush, Wm. O. Campbell, St. Louis, Mo.
1163074. Interchangeable tooth, Israel J. Fink, Cleveland, Ohio.
1163141. Artificial tooth, Thomas F. Glenn, Ardmore, Pa.
1162941. Hygienic protector for dental handpieces, Louis L. Martin and R. A. McTavish, Toronto, Ont., Can.
1164475. Automatic mallet or plugger, George Croston, Hoquiam, Wash.
1164597. Tooth-brush, Roy A. Darling, Pellston, Mich.
1164599. Crown tooth, Adelbert Fernald, Boston, Mass.
1165149. Matrix device, Frederick J. Bonnalie, Chester, England.
1164987. Method of and apparatus for projecting Rontgen images, Gustav Bucky, Berlin, Germany.
1164997. Dental amalgam, Thomas J. Davis, New York, N. Y.
1164715. Dental tool, Carl M. Hedmen, Chicago, Ill.
1165937. Dental flask-closing device, Robert Booty, Toronto, Canada.
1165964. Anchor for artificial teeth, Gustav E. Fritz and T. G. McMahon, Chicago, Ill.
1166269. Tooth-brush, Hallie M. Smith, Bedford, Ind.
1166033. Dental chip-blower, Frederick S. Yoder, Wernersville, Pa.
1167353. Anesthetic apparatus, Albert C. Clark, Chicago, Ill.
1167341. Mechanism for upsetting heads on fastening pins for artificial teeth, Karl Finckh, Berlin, and P. Almstedt, Berlin-Baumschulenweg, Ger.
1167062. Dental saliva-ejector, Ferdinand Groshans, Baltimore, Md.
1166766. Orthodontic appliance, Harry E. Kelsey, Baltimore, Md.
1166462. Breath deflector, Thomas J. King, Richmond, Va.
1166924. Rubber dam clasp, Freeman H. Newlin, Huntingdon, Pa.
1166796. Anatomical mannikin-head, Faneuil D. Weisse, New York, N. Y.
1166732. Dental floss holder, Denis K. Woodhouse, Chicago, Ill.
1168052. Dental instrument, Wm. W. Bolls, Washington, D. C.
1168212. Apparatus for swaging seamless crowns, Gailord M. Hiner and L. L. Hidy, Jeffersonville, Ohio.
1167833. Tooth-brush holder, William Metzroth, Syracuse, N. Y.
1168842. Pad for headrests, Bela Albrecht, New York, N. Y.
1168998. Tooth cleaner, Clyde K. Brandenburg, Klamath Falls, Oregon.
1168635. Dental-material condensing apparatus, Jephtha G. Hollingsworth, Kansas City, Mo.
1168965. Fountain tooth-brush, Esther Rosenblum, Los Angeles, Cal.
1168911. Dental instrument, Alexander Schutt, Bismarck, N. D.
1168574. Lip-retractor, Frank Spurr, St. Paul, Minn.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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ANESTHESIA IN DENTISTRY.*

WITH A BRIEF RETROSPECT.

BY DR. ARTHUR E. SMITH, CHICAGO, ILL.

(Special instructor in oral surgery and anesthesia in Loyola University, Dental Dept., New Orleans, and University of Tennessee, Dental Dept., Oral Surgeon, House of Good Shepherd, Chicago)

Mr. President and members of the Chicago Odontological Society: Allow me to say that I deeply appreciate the honor which you have bestowed upon me by inviting me to be present at your dinner and speak to you this evening. I fully realize that I am in the presence of men who have labored diligently in professional life and in dental education, and have succeeded in helping place our profession upon the high plane which it enjoys today. In the days of most of you when your respective schools were young and inexperienced, their charms were many and in these days they are even more. It was in those good old days of the past when you sat at the feet of your professors and listened to the expounding of the then current thought of the profession to which we aspire. Forget not those days, for from those to whom our college then confided the trust of teaching her sons came the purest, the best, the highest and the noblest of that day and generation. From that fountain poured forth a stream of knowledge, which, for its time was unsurpassed in wisdom, truth and eloquence. Didactics had then reached the pinnacle of its possibilities, its once unclouded star was passing into eclipse, and athwart the shadow which now bedimmed its glorious past was flung the banner of research and experimental dentistry, based upon facts and special training for certain specialties, then a thing unknown. But let me pause for just a moment while I pay respect to the exponents of those

* Read before the Odontological Society of Chicago, March 6, 1918.

days: to those who laid the foundation of and builded a system of teaching which met the demands of their day, and only gave way to the more practical methods of the present, when the increasing knowledge of experimental and practical dentistry demonstrated the superior advantages of the scientific methods of teaching along the ever broadening way of scientific dentistry, which now exacts tribute from every fundamental science. Our professional ancestors were giants in intellect, filled with the fire of love and enthusiasm for their chosen field, and from their tongues the double distilled extract of dental lore flowed like a limpid stream into the wide open mouths who listened in silence, upon their words, which sank deep down into the innermost hearts, minds and souls of you gentlemen who today are the foremost members of our profession. It has been a real pleasure to me to converse with several gentlemen who obtained their first dental education from the old school, and many interesting facts have been discussed, and in making a comparison of the methods employed years ago with those of the present day it makes me realize the great opportunity afforded the young man of today who is desirous of entering a noble profession. I am told that when the professor of oral surgery of the old school announced an operation for the day, there came a stampede, a mighty rush for front seats in the old amphitheatre, whose gray walls and dusty benches had looked on many a bloody scene, and where no intruding micro-organism dare thrust its uninvited face to mar the surgical technique of the operator who stood ready for the operation. Superfluous paraphernalia of the modern operating room was conspicuous by its absence, for no fear of the dreaded infections had chilled the ardor of the dental surgeon, but ready he stood, scalpel in hand, confident of his dexterity and skill, while each in the class gazed in wonderment and delight. Embryology, histology, pathology, microscopy, bacteriology, experimental physiology, the carving of plaster and bone teeth, radiographs, thorough root canal fillings and nerve blocking were but like shadows of coming events, and were in the outer limits of the penumbra, hence they were then as undiscovered fields, speculative in their possibilities and somewhat remote in their bearings. There was one connecting link in the demonstration of anesthesia in years gone by that was an eyeopener to the

uninitiated. For this special feature there was an ancient gasometer kept in seclusion from year to year in the extracting room which on stated occasions was brought forth and the patient was made unconscious by both asphyxiation and the physiological action of the gas which was then manufactured by a few gallons at a time. These few reminiscent remarks are not intended to bring reproach upon the past, for, indeed, the past served its purpose in its day, and the men who sat under the teaching of those days, had the fire of enthusiasm which lighted the way; and despite their meager opportunities, as we view them now; blazed their way into the world, rose to distinction in our profession and, above all, have realized the necessities of the ever broadening field of dentistry and demanded better for their sons of this generation and by their perseverance and untiring efforts placed the profession upon that high plane which it occupies today in the eyes of the world. To those of that class we extend the hand of gratitude and appreciation. Since those days many changes have come, but they came not all at once. Evolution is indeed a slow process, and even when the morphological type has been fairly well established, it is a long, long way to the fully developed and highly organized individual either in the animal or vegetable kingdom, and this process of gradual development is no less apparent in our educational advancement of the present day.

Speaking of evolution in education, there is one link in the chain which stands out as prominent if not more so than many others and that is the evolution which anesthesia has undergone during the past century. We should look at this wonderful advancement with pride, not only because of the fact that the relieving of pain for our fellow man is a great blessing, but because most of the credit of advancement in scientific research in both general and local anesthesia goes to the dental profession. The goal of Medicine and Dentistry as practiced today is efficient results, backed by thoroughness, and accomplished through the medium of clinical research.

During the last half century there have been incorporated in the scientific records of medical and dental science for the benefit of humanity three great achievements which have no parallel: anesthesia, antiseptics and antitoxins.

The untiring and constant search for some agent by which pain might be annihilated, is as old as the practice of Medicine, and it seems there is no other field in the professions of Medicine and Dentistry that has held forth such allurements for the investigator and has been so much desired on the part of the patient. It is indeed gratifying to compare the most efficient methods for alleviating pain we have at our disposal today with those practiced in years gone by.

To undertake to mention or discuss all the agents or methods employed in the past in the production of anesthesia would be unwise at this time, and the subject matter which could be correlated would easily fill a volume. The older methods were employed by the medical profession and we could dig up some interesting facts along this line. Dentistry, a comparatively new profession as compared with Medicine, however, enjoys the distinction of placing anesthesia upon the high plane which it enjoys today. The subject of anesthesia is a scientific and broad subject and when mastered by the student it places him in a position to render a service appreciated by the patient.

Within the past few years many fads have entered the ranks of our profession, and it is too true that many have regarded anesthesia in its various forms as a mere fad. Every new idea whether having merit or not has been expounded and in many instances thrust upon the dental profession. Allow me to say that any method having for its object a true ethical purpose and possessed of merit is deserving of our careful consideration and study. In many instances various methods and apparatus have been unloaded upon the dentists for commercial purposes, regardless of their merits. This is particularly true of the various apparatus and methods employed by members of the dental profession. Scientific methods are to be worked out by the laboratory man, the man of experience, and should be passed upon by exacting practical tests by the profession. When cataphoresis was introduced as a legitimate method of alleviating pain it was soon gobbled up and commercialized but it shortly passed into the archives of discarded remembrances. It was my pleasure and satisfaction to discuss a paper and clinic given by a medical man before one of our Eastern State Dental Societies. His method was boasted and lauded to the skies (by a few men) as

the only sane method of producing anesthesia, and it was stated that time honored methods would soon be discarded. His method was to press upon the fingers or toes, thus producing anesthesia. He divided the body up into zones and one of these zones extending from head to foot could be anesthetized. It was simply presto change—nothing like it. He claimed he could eradicate cancer and reduce goiter by this wonderful method, while yet both these conditions have baffled medical science. The statement that simply bringing pressure to bear upon a finger or toe would produce anesthesia at a point distant might be good “bunk” to spring upon the uneducated, but it would not appeal to intelligent men who have studied physiology and anatomy, and who know the complexity of the nervous system. I witnessed numerous demonstrations, and I for one was a patient, and not one case did I consider successful beyond merely suggestive therapy. There is no question but that psycho and suggestive therapy have immeasurable value in healing the sick, but must be used in an intelligent manner. Next we might mention analgesia, considered a fad by those who cannot produce it. Indeed it is a fad with many, but in the hands of the competent much good is derived through its scientific employment. Hundreds of gas machines throughout the country are not in use, and are pushed back in the corner covered with dust. It has given me much satisfaction during my travels to inquire of many dentists just why they discarded this method, for in nearly every case they would say they did not obtain results; and upon questioning them further they would acknowledge they were not in a position to administer the anesthetic properly. Nitrous oxid-oxygen is yet without a peer as a general anesthetic; the safest in the hands of the experienced and the most dangerous in the hands of the novice. Just because hundreds have discarded it, it does not signify by any means that it is worthless, but in the hands of the operator qualified to administer it scientifically it stands supreme among general anesthetics. Analgesia, meaning partial anesthesia, is difficult to obtain and maintain by the inexperienced anesthetist, but in the hands of the man who understands it a great deal of good can be accomplished through its medium. Many dentists took advantage of this partial stage of anesthesia and tried to perform operations which demanded

deep anesthesia. That is no crime against the true worth of gas-oxygen, but speaks against the man holding the mask.

Next in line is local anesthesia divided up into many forms. This method is no doubt the best yet presented to date, yet I can see the handwriting upon the wall. When an operator does not know the difference between nerve blocking and terminal or infiltration methods or employs hydrant water as a vehicle, something is radically wrong, and it shows that he has sadly neglected his study along these lines. During my lecture and clinic work for schools, societies and study clubs I have come in contact with hundreds of dentists and physicians and have listened to many interesting theories, and the expounding of various methods in this particular branch of anesthesia. It is astonishing to see how many take up a subject of this character and subject their innocent patients to experimental procedures, without having practically any knowledge of the underlying factors of this method. It is also astonishing to see how many dentists allow the dental salesman to dictate what they should use and how they should use it. This is by no means said without due respect to our well meaning dental salesman, but the point I wish to drive home is that the dentist should employ preparations and methods worked out and advocated by professional men who know whereof they speak. Take for example the many pet unethical local anesthetic solutions upon the market today, each manufacturer proclaiming wonders for his particular concoction, and that it does not deteriorate, and is always sterile, it does not produce any after effects, and is absolutely non-toxic. When we stop and analyze all these statements we realize how impossible they are. The dentist who is familiar with chemistry, pharmacology and physiology knows they are absurd, yet hundreds of dentists purchase these preparations and inject them promiscuously into their patients, and even in some cases do not know what they contain. I advocate only those agents which have stood the acid test of scientific research, and practical application, each ingredient or formula being recognized by men of authority. The promiscuous use of any anesthetic is a very poor and dangerous practice, and should be stopped. Any agent, like an anesthetic—local or general, which produces an abnormal condition is to a certain extent dangerous, and it behooves the

anesthetist to be familiar with the physiological action of his agent; yet when he selects the agent with care and administers it with intelligence the results are highly gratifying. The principle of inhaling volatile substances to produce analgesia or anesthesia is very ancient, in fact, as old as the practice of Medicine itself. In the third century a Chinese surgeon is said to have employed some sort of anesthetic drug, and the Romans used mandrake to stupefy criminals at the time of crucifixion. A surgeon of Naples also tells of volatile drugs that were used for anesthesia; hyoscyamus, poppy, solanum and belladonna. These drugs were kept in leaden vessels and when their fumes were inhaled the individual passed into a most profound slumber and was rendered insensible to pain. Numerous other methods were employed in days gone by, and a constant search has been made for some drug that would fulfill the requirements of an ideal anesthetic. In the years 1844-1846 the discoveries of Drs. Wells and Morton marked the beginning of real advancement in anesthesia, and it was America that gave this great gift to humanity, and the world owes her an everlasting debt of gratitude. From that time until the present day a gradual development has been made, not only in improving the method and technique of the scientific administration of Nitrous-oxid-oxygen and ether, but also nerve blocking and many other valuable agents for alleviating pain and surgical shock. This gradual advancement of all anesthetic that are at our command today, both general and local has made anesthesia a distinct science. The rapid progress in scientific research which characterizes the past fifty years, is a living appeal for the idealism of a more enlightened age. The knowledge attained in the anesthetic art gives us a great inspiration for further progress, and a realistic tendency for modern thought. Many times anesthesia has been discredited by professional incompetence, and consequently the failure to attain results should in no way discourage the modern trend.

REACHING THE GOAL OF A SHOCKLESS OPERATION.

In years gone by it was the custom to select only one general anesthetic in surgery, but modern research has proved that in order to attain the desired goal of a shockless operation it is far better to select a combination of methods, and follow a definite

technique in order to reach the highest ideal. We must acknowledge as a fact that the dental practitioner is confronted many times with operations which cause pain and this factor has acted as a stumbling block in rendering the best service, and does in many instances create in the mind of the patient a horror for the treatment that is so necessary for the proper maintenance of health. In this day and age of anesthetics there is no more reason why a dentist should inflict pain while rendering service than a surgeon does amputating a leg. However, it is not in all cases the amount of pain really inflicted that causes emotional shock or collapse, but in many, such results can be attributed to the fear of being hurt. The clinical and laboratory research on shockless operations, accomplished by Dr. Crile of Cleveland is really a revelation, and his clinical records prove the value of well selected methods. He says: "The word anesthesia—meaning 'without feeling'—describes accurately the effect of inhalation anesthetics. Although no pain is felt in operations under inhalation anesthesia, the nerve impulses, set up by surgical operations, reach the brain. These are the afferent impulses which cause pathological brain changes. In this manner traumatic shock is caused. How can we prevent it? On the Kinetic theory, no shock could be produced by traumatizing a territory whose nerve connection with the brain has been broken by nerve blocking. By blocking nerve connections, local anesthetics protect the brain against destructive stimulation of the brain cells. Each anesthetic covers a part of the field, but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. The patient's fear of the operating room, unsoothing words, and the dread of the operation and the taking of an anesthetic, the rough manipulation of the tissues during the operation, and the ungentle post-operative manipulation, all these things generate harmful stimuli which are sent to the brain and cause detrimental effects, the stored up energy in the normal brain cells being destroyed."

These harmful stimuli, which in the past have played an important role in causing a high mortality rate, are now blocked by the anoci-association method and in consequence there is a decrease in the mortality rate to an extent one can hardly believe. This new principle excludes all harmful stimuli reaching the

brain and the bad risk patient has a greater chance to live than the patient who is operated without the blocking of these impulses. This is accomplished in modern surgery as follows:

- (1) By exclusion of fear and dread of the operation.
- (2) By the administration of morphine and scopolamine one hour before the operation.
- (3) By the scientific administration of N_2O & O.
- (4) By nerve blocking.
- (5) Careful post operative treatment.

Dr. Crile also makes the following statement: "No matter how extensive the operation, no matter how sick the patient, no matter what part is involved, if anoci technique is perfectly carried out the pulse rate at the end of the operation is the same as at the beginning, and the post-operative rise of temperature, the acceleration of respiration, the pain, the nausea, and the distention are minimized or wholly prevented." Is it not just as important that the dental practitioner should endeavor to eliminate detrimental factors from his operations as for the modern surgeon? It is true that the operations performed by the dentist are not so grave in character as those of general surgery, yet they are just as important, and the patient appreciates the accomplishment of dental service free from pain. How is it possible to avoid the dread, the fear, and the pain caused by dental operators? It can be accomplished through the medium and proper application of proper pre-operative environment; a preliminary sedative if necessary; Novocain-Suprarenin-Ringer solution Nitrous oxid-Oxygen; careful operative procedures; proper application of psycho-therapy and efficient post operative treatment.

NERVE BLOCKING FOR OPERATIONS IN ORAL SURGERY.

The development of local anesthesia has been of great magnitude during the past few years and has found a place in modern surgery. This important branch of anesthesia has been developed to such an extent that it has not only attracted the attention of the oral surgeon and dental practitioner, but the general surgeon as well, and we are now able to obtain results heretofore unattainable through the medium of general anesthesia. It is a well-known fact that many times the oral surgeon is handicapped while operating for various pathological condi-

tions on the jaws or within the oral cavity when a general anesthetic is employed.

The head and neck offer an available field for operations under nerve blocking. This is especially true of operations involving the face and jaws from the very fact of the constant location and susceptibility of the nerve trunks supplying these parts. The modern trend has been in the direction of blocking the deep nerve trunks and this technique has made possible many major operations which were heretofore performed only under a general anesthetic. It goes without saying that nerve blocking should only be employed in cases where it is possible to completely block the operated area and render it insensible to pain.

Nerve blocking is technical and demands skillful technic in its employment in order to attain satisfactory results for both the operator and the patient. Considerable skill is required in making the deep nerve-blocking injections, and every one must expect failure at the beginning. The operator should blame failure to the technic used and should search diligently for the cause of failure to render the parts insensible to pain. The trained anesthetist can make a most valuable use of psycho-therapy in addition to his general anesthetic, and this is of exceptional value to the operator employing local anesthesia in its different branches. The imperfection of the technic often leads the operator to persuade his patient and he himself labors under the delusion that the patient experienced no pain. When the operation is upon a patient who is hysterical and of nervous temperament, and anticipation and fear of pain are added to the adverse conditions which go to make up the failure, the patient may actually cry out and manifest a high degree of excitement during the operation and afterward tell the operator that she felt no pain. This type of patient should never be given a local anesthetic, but a general anesthetic should be employed, because the dread of the operation and the fear of being hurt is as wearing upon the nervous system as is the actual pain. In every case requiring an anesthetic we should use our best judgment in deciding which to use:—a local or a general anesthetic. The nature of the operation and the physical condition of the patient should both be taken into consideration in the selection of the anesthetic. The anesthetist must not be hasty in his decision.

Modern surgeons have recognized the value of local anesthesia, and at the present time extensive operations are performed with great advantage with its scientific employment. Its field has been greatly aided by the vast amount of research work accomplished within late years. Much credit is due to those who have contributed to this important branch of anesthesia, especially Braun, Crile on anoci-association, Fischer, Shultz, Hertzler, Lyon, Allen, Thoma, Blum and Silverman. Extensive major operations can be performed under nerve-blocking and this field has been greatly broadened by the knowledge that the viscera is innervated by purely visceral nerves which are insensitive and sensation exists only in those nerves which receive branches from the somatic nerves. In late years it has been found that the viscera can be cut, sutured and handled without any severe pain if they are not pulled upon, which, of course, leads to the advancement of modern surgery and anesthesia, hence the value of anoci-association. One of the greatest advantages of operating under nerve-blocking is the freedom from anesthetic accident, blood changes and anesthetic discomforts. The disadvantage of local anesthesia is the patient's knowledge of what is taking place. This may be overcome in nearly every case if the anesthetist is tactful, masterful and assuring. Many surgeons are employing local anesthesia with satisfaction for the following operations: Appendicitis, hernia, empyemia, gastrostomy, tracheotomy, goiter, rib resection, inguinal colostomy, various amputations, varicocele, hydrocele, circumcision, ligation of arteries, removal of subcutaneous tumors, and other general surgical operations.

The advantages of nerve-blocking anesthesia for oral and dental surgery operations are many but the following are probably the most important: First, the duration of the anesthesia may be changed according to the various amounts of the vaso-constricting agent. The long duration of anesthesia is of great value to the operator for the removal of impacted third molars, draining the antrum, root amputation, removal of tumors, removal of cysts, resection of the jaw, curettement of necrosed bone plastic operations, removal of tonsils, and many other operations which come under the observation of the oral surgeon.

Second, long duration of anesthesia permits the operator

to take his time with the operation, which gives him the opportunity to employ all his skill while operating.

Third, large or small areas may be anesthetized, depending upon the nerve or nerve branches to be blocked.

Fourth, anesthesia is secured of infected or inflamed areas by blocking the nerve branch in healthy tissue at a distant point from the operative field.

Fifth, nerve-blocking injections, when skillfully made, are without pain because the needle is inserted into the mucous membrane and loose connective tissue.

Sixth, one or two insertions of the needle will block an operative field, depending upon the nature of the operation and the area to be blocked.

Seventh, co-operation of the patient. It is well known that this is of material advantage to the operator because he can operate with ease and complete the operation with a minimum amount of laceration and without the inspiration of blood and mucus.

Local anesthesia is divided into first, nerve-blocking anesthesia; second, terminal or peripheral anesthesia. The terminal or peripheral method is divided into several subdivisions, which are given in the order of their importance in the writer's opinion:

First, Intra-osseous method; Second, Infiltration method; Third, Peridental method; Fourth, Pressure anesthesia. For the terminal or peripheral method, or any of its subdivisions anesthesia is brought about by inhibiting the function of the terminal or peripheral nerves in a circumscribed area. Nerve-blocking, or in other words, conduction anesthesia is accomplished by injecting the anesthetizing solution near the nerve tissue at some point between the operative field and the brain. The nerve-blocking method is divided into the extra-oral and intra-oral, second into peri-neural and endo-neural methods.

For the peri-neural method of nerve-blocking the solution is injected into the neighborhood of the nerve trunk supplying the operative field, and the solution reaches the nerve by diffusion, while for the endoneural method the needle point is inserted into the nerve direct and the solution injected. The latter method is of little or no value in the production of anesthesia for oral surgery and is used to a small extent. We are aware of the fact

that the finest branches of the terminal nerves are covered only by a very thin sheath and this sheath increases in thickness as it passes toward the brain. It is evident that the smaller the nerve the more readily an anesthetizing solution will reach the fibers making up the nerve sheath, thus blocking painful impulses. Now, it can be said that the larger the nerve trunk and the thicker the nerve sheath that a longer period of time must be allowed for the anesthetizing solution to produce complete anesthesia of that particular nerve trunk. Some operators overlook this important phase of technic, in not allowing sufficient time to elapse between the time of injection and the time for operation. For the terminal anesthesia method the solution is injected into a circumscribed area and the solution comes in contact with the fine terminal endings and their sensory end organs. The area of operation is infiltrated and has its drawbacks in many operations. The first advocate of the deep injections was the American Corning, who introduced it to the profession in 1887. Following this Braun called the method conduction anesthesia. It appears to the writer that the term nerve-blocking is superior to the term conduction. The time required to wait for anesthesia following the injection into the nerve trunks depends upon these factors:

1. Diameter of the nerve trunk and thickness of its nerve sheath.
2. Percentage and amount of anesthetizing solution injected.
3. The skill of the operator in depositing the solution in the right location. The operator must bear in mind the required time to wait for anesthesia and not be too hasty in beginning the operation before complete anesthesia has intervened. It might be stated here in a general way that the time to wait following the injections of solution into the various nerve trunks supplying the operative field of the oral surgeon, is from one-half minute to fifteen minutes, depending upon the size of the nerve or nerve trunks which have been blocked.

The specialist or practitioner taking up the various forms of local anesthesia and more especially the deep nerve injections must appreciate that it involves many important details; and that each step is a well-defined and separate feature; and that neglect or over-sight in any of these details may result in an unsatisfac-

tory anesthesia. The following rules should be strictly adhered to to obtain satisfactory results.

First, a thorough knowledge of the anatomical parts. Second, strict adherence to asepsis. Third, carefully selected equipment. Fourth, the technic must be mastered. Fifth, judicious selection of the correct methods to be employed in each individual case. Sixth, diagnosis of any and all existing conditions. Seventh, the use of an isotonic anesthetic solution composed of ingredients corresponding to the physiological laws of osmotic pressure and functions of the living cell.

A THOROUGH KNOWLEDGE OF THE ANATOMY NECESSARY.

It is impossible at this short time to discuss the anatomy that is so necessary for the operator to know, but I refer him to any standard text-book and the dissecting room. I wish to lay special stress upon the absolute importance of a thorough knowledge of all the anatomical parts, especially the osteology, the nerve branches and their relationship to others, together with their communicating branches. A thorough knowledge of the anatomy and anatomic relations is absolutely necessary to give the nerve-blocking injections; otherwise how can you obtain the desired results? You will only subject the patient to an experimental procedure.

DISSECTED WET ANATOMICAL SPECIMENS.

I am a firm believer in dissected wet anatomical specimens from the very fact that they are instructive. The student and post-graduate can obtain more practical knowledge from a few hours' conscientious studying of carefully prepared specimens or in the preparation of the specimens than to spend days perusing books on anatomy. It has been my pleasure to prepare a large number of specimens, which have proved of immeasurable value in the execution of my work and to members of the profession who have studied them. These specimens were carefully embalmed and prepared before sectioning at various levels. They show the different nerve trunks and branches, ganglia, arteries and veins, and bony landmarks. They show all the anatomic landmarks in their relationship to each other, which come under the operative field of the oral surgeon as well as the eye, ear, nose and throat specialist. Time will not permit me to go into

the dissection of these specimens, but I desire to refer to one in a very concise manner. The head was sectioned through the median line, and on incision made from the external angular process of the frontal bone to a point 3 cm. above the pterion, then to a point anterior to the anti-tragus—extending downward to a point midway between the sigmoid notch and the angle of the mandible. After making this incision a flap of skin and muscle was carefully separated from the periosteum over portions of the following bones: temporal, parietal, sphenoid, maxillary, malar and ramus of the mandible. Portions of these bones were trephined away and a portion of the temporal and frontal lobes of the brain removed, exposing the following structures: Gasserian ganglion, first, second and third divisions of the fifth nerve, the posterior, middle and anterior superior alveolar nerves, Meckel's ganglion, posterior, middle, anterior, and naso-palatine, inferior dental and lingual nerves, internal maxillary artery and several of its branches. The superficial origin of the fifth cranial nerve is at the side of the pons varolii and is shown connecting with the Gasserian ganglion. The fifth nerve and all its branches are carefully exposed to their termination. The various foramina, such as the infra-orbital, mental, anterior palatine, posterior palatine, posterior superior alveolar, inferior dental, show the nerve trunks as they pass through them. It is very instructive for the operator taking up this work to practice placing the needle in the various regions for making injections. In this way he will become familiar with the depth and direction of the needle for blocking the nerve trunks. Many hours are required to properly prepare specimens but one is amply repaid by the careful dissection required to properly prepare them.

STRICT ADHERENCE TO ASEPSIS.

Successful surgery is clean surgery. Antisepsis is the destroying of bacteria or septic conditions in wounds or tissues by the use of some germicidal agent. Asepsis is the practice of thoroughness in a wound already sterile. Sepsis is a condition where specific or infective bacteria exist, and where inflammation in some degree follows. It is needless to say that absolute adherence to asepsis must be followed in all forms of local anesthetic injections, but more especially the blocking of the deep nerve trunks. We are aware that it is almost impossible to ren-

der the mucous membrane absolutely sterile by reason of the delicacy thereof, but we may have an almost if not quite sterile area for the insertion of the needle. Many different forms of micro-organisms are present in the mouth and it follows that we must be very careful in considering any and all existing pathologic conditions.

Any operation coming within the bounds of the oral or dental surgeon should be performed under and within the utmost regard for the principles of asepsis. The puncturing of the mucous membrane for the insertion of the needle prior to making an injection seems of little importance to some practitioners, and, while it is true that the tissue tolerates numerous punctures, yet it is inevitable that the practitioner who disregards asepsis will have his regrets in the future. The deep nerve-blocking injection is different from the other forms of local anesthesia because the needle puncture is made at a point some distance from the field of operation and can in most cases be made in healthy tissue. This holds true in practically all of the dental operations. In such cases as come under operative dentistry the oral cavity is more or less free from pus and nerve-blocking injections may be made by the intra-oral method. However, if the oral cavity is infected and pus is present, indicating infection; or if the operation comes under the head of surgery, the needle should be inserted into the tissue with caution. In a large number of cases it is possible to block a nerve by the extra-oral method either in the case of fractures of superior or inferior maxillary bones or for the removal of impacted third molars, curetting of the antrum, or resection of the jaw, coupled with infection producing partial or complete closure.

If the intra-oral method is employed the tissues within the oral cavity should be sprayed with an antiseptic solution. After this, the mucous membrane in the range of the puncture should be thoroughly dried and this is done best by using several pieces of sterile gauze held with artery forceps. Then apply a germicidal solution. I have tried many different solutions for this purpose, but have found none as efficient as equal parts of tincture of iodine and ethyl-alcohol, which gives $3\frac{1}{2}$ per cent solution of iodine and minimizes the chances of causing sloughing or cauterizing of the mucous membrane. Tincture of iodine

is one of the most efficient antiseptics and germicides known to modern surgery. When it is used on a surface containing bacteria it will destroy them and leave the tissue in the best possible condition for repair. The extra addition of alcohol is of value in reducing the standard tincture of iodine as is given in the U. S. P. formula, and has some germicidal properties. This solution can be applied very freely covering a surface from 2 to 5 centimeters in diameter. This antiseptic solution is applied to the surface by a pledget of cotton wrapped around a small wooden applicator, such as is used by the nose and throat specialist. This is an excellent medium and is inexpensive. After this technic has been carried out, the area should be protected and great care exercised so as not to permit saliva or any moisture to come in contact with the surface prepared for the reception of the needle.

PRELIMINARY AGENTS.

I have found it advisable in some cases for oral surgery to administer a preliminary agent to relieve the hypersensitive or hysterical patient of the feeling of anxiety, restlessness or apprehension. The preliminary sedatives which I have found to be of exceptional value in the execution of my anesthetic work are as follows: Validol, Bromural, bromides, and chloral hydrate. I find it is seldom necessary to resort to morphin as a preliminary agent. Bromural is an efficient nerve sedative and has no apparent action on the circulation or respiration. It is an agreeable hypnotic and sedative and can be administered without any after effects. It is best given in 5 grain tablets in warm water 30 minutes before the operation. Validol is a colorless substance insoluble in water. Therefore, it should not be added to water before administering to the patient. A very efficient method for giving this drug is to drop the proper dose, which is 7 or 8 minims, on a block of sugar. This has been suggested by Dr. C. Edmund Kells of New Orleans. The preliminary agent should be administered at least 30 minutes before operating.

I will now attempt to cover in a concise manner the technic for the injections under the intra and extra-oral methods which are most important to the oral surgeon.

MANDIBULAR-LINGUAL ANESTHESIA.

BLOCKING THE INFERIOR DENTAL AND LINGUAL NERVES—INTRA-ORAL METHOD.

Have the patient open her mouth as wide as possible, place your index finger against the ascending ramus allowing the palm of the finger to rest upon the occlusal surface of the lower teeth. Great care should be exercised to not mistake the dense connective tissue, which covers the anterior surface of the masseter muscle in some cases, for the ascending ramus. This can be overcome by having the patient open and close the mouth slightly, and should the index finger rest against the anterior surface of the masseter muscle it will be found that resistance will vary, whereas, if the tip of the index finger rests against the ascending ramus the resistance will remain the same. Next locate the external and internal oblique lines and the trigonum retro-malare with the dorsal surface of the finger toward the median line. Allow the radial side of the index finger to rest upon the occlusal plane of the lower teeth. Now retract the mucous membrane beneath the finger to give ample room for the needle to pass the end of the finger nail. Now force needle through mucous membrane, striking the inner oblique line. The width of the average index finger is 2 cm. and when the mucous membrane is punctured at the middle of the finger nail, it makes an excellent guide in puncturing the mucous membrane in this location. The distance from the puncture of the mucous membrane to the periosteum covering the inner oblique line is about 5 mm. Allow the barrel of the syringe to rest over the bicuspid on the opposite side of the mouth. Be careful to keep the needle a distance of 10 mm. from the occlusal plane of the lower teeth. When the internal oblique line is reached with the needle, cross the median line to a point outside the arch on same side of injection. Be very careful not to allow the point of the needle to go beneath the periosteum. When the syringe is on the outside of the arch on same side of injection insert needle posteriorly about 5 mm. and inject $\frac{1}{2}$ cc. of the solution so as to anesthetize the lingual nerve. The lingual nerve is located 5 to 7 mm. from the inner surface of the ascending ramus. Now bring the syringe back across the median line, this distance being governed by the amount of divergence of the two rami. Now insert the needle

10 mm. to reach the inferior dental nerve. If the syringe has been held in the proper position the point of the needle will reach the periosteum at an acute angle to the inner surface of the ascending ramus in the region of inferior dental foramen when at a depth of approximately 20 mm. Before injecting the solution into the mandibular fossa, it is well to work the syringe back and forth one or two millimeters and inject the solution only when the point of the needle rests against the periosteum.

Inject $1\frac{1}{2}$ to 2 cc. of this solution for the inferior dental nerve. It is necessary, for best results, to work the syringe back and forth slightly at the time the solution is being discharged, in order to assist the tissue in absorbing the solution and not to cause a too rapid distension of the soft parts. The amount of solution used for inferior dental and lingual nerves in the average case is $2\frac{1}{2}$ cc. If the operator is skillful in his technic, operations can be begun, in some cases, within five minutes after the injection. The needle used for this injection is 30 mm. long and 24 gauge, made of iridio platinum. Anesthesia will be secured in the greater part of the lower jaw.

The producing of anesthesia near the median line depends upon how rich the nerve supply is in this particular region between the inferior dental and lingual nerves on the injected side and their fellow nerves on opposite side. Following the blocking of the inferior dental lingual nerves on both the right and left sides of the mandible anesthesia is produced in the lower jaw in the greater percentage of cases. In a small percentage of cases the blocking of these various nerve trunks on both sides does not render insensible to pain the tissue in the region of the median line labial to lower incisors because the cervical plexus in a few cases supplies this particular region with nerve branches. When this is found to be the case, the incisive nerve-blocking injection is made by inserting the needle at the side of the median fold of mucous membrane and forcing the needle into the base of the left incisor fossa, then retract the needle without taking it out of the tissue, and force it down into the right fossa and inject the solution. Deposit 1 cc. in each fossa. The blocking of these nerves should be sufficient to enable the operator to extract all of the teeth, reduce a fracture, remove necrosed bone, remove pulps

from the teeth, or remove a cyst or tumor either in the region of the mandible or from the soft tissues in the floor of the mouth.

BLOCKING THE SECOND DIVISION OF THE FIFTH NERVE—INTRA-ORAL METHOD.

The writer worked out the technic for this particular injection some months ago and has used it in a large number of cases with satisfaction. This injection, with several others, was carefully worked out on the cadaver and they promise to be of exceptional value not only to the oral surgeon, but also the eye, ear, nose and throat specialist as well. The blocking of this large nerve trunk is an easy matter provided the operator is thoroughly acquainted with its technic. The maxillary or second division of the fifth nerve passes from the brain through the foramen rotundum and crosses the sphenomaxillary fossa entering the floor of the orbit. At this level the sphenomaxillary fossa from the foramen rotundum to the posterior part of the orbit is, in the average case, from 7 to 10 mm. in width. The needle is inserted into the region of the second division posterior to the floor of the orbit and the solution injected. The technic for this injection is as follows: Use a needle 36 mm. long, 24 gauge, attached to an extension hub having a certain curvature. The mucous membrane is punctured by the needle in the fold where the cheek blends with the gum tissue at a point superior and lateral to the upper third molar. The needle is now directed upward and inward keeping it in contact with the periosteum covering the posterior lateral curvature of the tuberosity of the superior maxillary bone. This route is devoid of arteries and veins. The depth of the needle is approximately 3 cm. in the average adult case. The amount of solution used is 3 cc. Time to wait for anesthesia is from 5 to 15 minutes. Anesthesia is secured in all the parts which are supplied by the second division of the fifth cranial nerve. The following operations can be performed: Resection of the superior maxillary; extraction of teeth, reduction of a fracture; amputation of roots of teeth, establishment of drainage or curettement of the antrum, and nasal operations. If the opposite side is blocked operations near and involving the median line as well as on the opposite maxillary bone can be performed, including operations for hare-lip and plastic operations. Time does not permit

me to take up the blocking of the smaller nerve trunks which are branches of the second division. These are blocked intra-orally and are of great importance to the oral surgeon.

EXTRA-ORAL BLOCKING FOR THE INFERIOR MAXILLARY OR THIRD
DIVISION OF THE FIFTH NERVE.

The skin through which the needle is to be inserted must be thoroughly prepared. The part must be thoroughly cleansed and followed with an application of bichlorid solution or tincture of iodin. I make an initial injection into the skin with a fine, sharp needle in order to eliminate the pain which would be caused by the regular needle for the deep injections. After this initial injection has been made the long needle is used, which is 23 gauge and 5 cm. long.

The following technic is employed. Have patient open and close mouth slightly. Locate the space between the lower portion of the zygomatic arch and the upper portion of the ascending ramus, between the coronoid process and the condyle of the mandible. The following landmarks are carefully followed. Before the skin is prepared draw a line parallel to the lower margin of the zygomatic arch directly above the sigmoid notch on the mandible. Connect the two ends of this line by following the lower border of the sigmoid notch. This will give a semi-circle and indicates the location of the sigmoid space. Puncture the skin with the needle in the center of this area, allowing the needle to form a right angle with surface of skin. Now direct the needle inward to a depth of 4 cm., which is the average distance in most cases. The point of the needle should be anterior to the foramen ovale which transmits the third division of the fifth nerve. Inject 3 cc. of the solution. Anesthesia of the lower jaw on side injected should occur in from 7 to 15 minutes.

EXTRA-ORAL METHOD FOR BLOCKING THE SUPERIOR MAXILLARY OR
SECOND DIVISION OF THE FIFTH NERVE.

The blocking of the superior maxillary division of the fifth nerve in the sphenomaxillary fossa is as easily accomplished as the blocking of the third division. First locate the anterior surface of the ascending ramus and the anterior margin of the coronoid process of the mandible. Next locate the lower margin of

the zygomatic arch in this region. Now draw a line along the lower margin parallel to the zygomatic arch. Next draw a line parallel and anterior to the coronoid process of the mandible, which is in a perpendicular position. A right angle is now formed. Now connect these two right-angled lines with another line thus forming a triangle. After the skin has been treated aseptically, a puncture is made with a fine needle in center of triangle for the initial injection. Then use the same needle as is used for blocking the third division. Direct the needle backwards, inward and upward for a depth of 20 mm. In the average case the point of the needle should strike the periosteum covering the posterior lateral tuberosity of the superior maxillary bone. At this point is located the posterior superior alveolar foramen containing the posterior superior alveolar nerve. The point of the needle strikes the periosteum thus indicating the needle is going in the right direction. Force the needle past the tuberosity 20 more mm.

The point of the needle should then enter the region of the second division of the fifth nerve within the sphenomaxillary fossa. The point of the needle should be located just posterior to the posterior-inferior margin of the orbital cavity while the solution is being injected. Inject three cubic centimeters. The depth of the needle in the average adult case is four centimeters. The needle should be five centimeters in length. Anesthesia is secured in most cases from five to fifteen minutes. The structures anesthetized include the following: All structures supplied by the second division of the fifth nerve such as the superior maxillary bone, teeth, antrum, gum tissue, portion of cheek, periosteum and half of palate, etc.

EXTRA-ORAL METHOD FOR BLOCKING THE INFRAORBITAL AND ANTERIOR SUPERIOR ALVEOLAR NERVES.

Locate the infraorbital foramen with the index finger, then bring it down allowing it to rest directly over the foramen which is located at a point 1 centimeter beneath the infra-orbital margin. Use a fine sharp needle as described heretofore for the initial injection. Now follow the initial injection with the regular needle which is of iridio-platinum, 24 gauge and 3 centimeters long. The injecting needle is now forced upward and backward to a depth of 1 centimeter in the majority of cases. Inject 2 cubic centimeters of the

solution at the opening of the infra-orbital foramen. Next massage the skin directly over the area injected, thus forcing the solution backward into the infra-orbital canal to a distance of 5 millimeters in most cases thus allowing the solution to come in contact with the anterior superior alveolar nerve. Anesthesia is secured in the following structures in less than 5 minutes; Central, lateral and cuspid teeth, side of nose, upper lip, alveolar process, labial tissue, anterior wall of antrum, and periosteum providing the anastomoses is blocked on the opposite side of the median line and of the middle superior alveolar nerve branch.

Local anesthesia may be employed for any operation around the face or about the jaws provided the operator understands his anatomy and is careful and exacting in his technique. It is absolutely necessary for the operator to know what nerves are to be blocked and how extensive an area of anesthesia must be produced in order to operate without inflicting any pain during the operation. If the operation is for the removal of a malignant growth or even a benign condition or the curetting of necrosed bone or treatment of empyema of the antrum, local anesthesia has an advantage over a general anesthetic for the reason that in most cases the patient will consent to an earlier operation. Last but not least one may add that nerve blocking anesthesia renders the area of operation less bloody and the operator is not handicapped by a general anesthetic mask. Many anesthetists and oral surgeons who have familiarized themselves with this method of anesthesia state that it has many advantages over general anesthesia in nearly all cases and they will not abandon it for the general method.

NERVE BLOCKING ANESTHESIA FOR TONSILLECTOMY.

During the past few years I have spent considerable time in working out a nerve blocking technique for the removal of the tonsils. My findings along this line have been very satisfactory and it gives me great pleasure in presenting this technique to the eye, ear, nose and throat specialist. We are well aware of the fact that the medical man has not followed a definite system in injecting the solution. He has injected the solution promiscuously into the pillars of the tonsil and tonsillar tissue and in many instances the tissue has been in a state of degeneration containing pus and necrotic material. We are aware of the fact that when solution is injected into tissue

of this character there is great danger of disseminating infection and carrying infected material into healthy tissue. I am quite sure that no learned dentist would be guilty of injecting solution into inflamed tissue or an alveolar abscess. It is impossible for me to give the detailed technique for blocking the tonsils by the deep nerve blocking method but I will attempt to give the nervous anatomy and a brief outline of the technique. The tonsil derives its nerve supply from two different sources. Its principle nerve supply comes through the branch of the glosso-pharyngeal which unites with the branches from the pharyngeal plexus thus forming the tonsillar plexus which is located at a point posterior lateral to the base of the tonsil. The second supply is from Meckel's ganglion which is located in the sphenomaxillary fossa, which gives off a number of branches. The branches which interest us just now are the nasal, pharyngeal, nasopalatine, anterior, middle and posterior palatine. The anterior palatine passes through the posterior palatine foramen and supplies the tissue in the soft and hard palate communicating with the nasopalatine branch which passes through the anterior palatine thus forming the inner nerve loop. The middle palatine nerve is distributed to the mucous membrane of the soft palate, uvula, and palatine tonsil. The posterior palatine branch supplies the mucous membrane of the tonsil, soft palate, uvula and a portion of the pillars. The technique for blocking the tonsil is as follows: The plexus tonsillaris and the pharyngeal plexus are located posterior and lateral to the base of the tonsil. These structures are blocked by inserting the needle midway between the occlusal surfaces of the upper and lower teeth, puncturing the mucous membrane at the base of the tonsil beneath the plica semilunaris and directing the needle backward and laterally to a depth of approximately 2 cm. 2 cubic centimeters of the solution is injected. The other nerve supply of the tonsil which is from branches of Meckel's ganglion is blocked in the same manner as given above in the technic of blocking the second division of the fifth nerve by the intra-oral method, with the exception that the needle is not forced in to the depth of 3 cm. but 2 centimeters in the average case thereby anesthetizing the palatine branches which are located in the sphenomaxillary fossa. We are aware that it is difficult to carry out the technic on a very young person unless the operator can obtain and maintain the confidence of his little patient. In my opinion this method proves of excep-

tional value for the removal of tonsils and will prove of great advantage in many cases over general anesthesia.

THE ANESTHETIZING SOLUTION.

For my anesthetizing solution I employ in most cases Novocain-Suprarenin-Ringer solution. I use only freshly distilled sterile water adding the proper number of tablets at the time of operation to give the proper percentages of the vaso-constricting agent and anesthetic. The tablet contains all the ingredients, i. e., novocain, suprarenin and Ringer's constituents. In most cases a 2 per cent solution is employed. A stock Ringer solution is not employed.

An isotonic anesthetic solution composed of known amounts of ingredients corresponding to the physiological laws of osmotic pressure and functions of the living cell should always be employed.

Time will not permit me to go into the technique of other blocking injections which can be employed by the oral surgeon or the eye, nose and throat specialist to a good advantage in those operations which they are called upon to perform. I trust that this simplified technic presented here for extra-oral and intra-oral methods will be of some value to the oral surgeon and to the general practitioner. It has been my pleasure to carry out considerable research work on cadavers and it has been the aim to make the technic simple and practical, combining efficiency with ease for blocking the various nerve trunks.

In addition to the research work on cadavers, I have also been working out the comparative toxicity of a number of the local anesthetics which are at our disposal and hope to publish this report in the not distant future.

In conclusion allow me to state that it is the duty of every dentist to study and apply that which the sciences of medicine and chemistry offer, and the day for the practitioner to inflict pain upon his patient is rapidly passing, and sooner or later they will grasp the tool of efficiency and travel with the modern trend. It is self evident that an operator can render better service when the patient is free from pain and last but not least every individual will appreciate such service. When service can be successfully and painlessly rendered without endangering the health of the patient, it is always advisable, for any agent that has for its object the relief of pain is worthy of our earnest consideration and study. The constant aim

of the conscientious practitioner of Medicine and Dentistry should be to assuage the pain to which mortality is heir and put forth every effort in combating disease and pain, not from a remunerative, but from the humanitarian standpoint. It is this uplifting and consecrated zeal, akin to veneration for the profession, which should be dear to him and which has given the world the masters of the profession.

SILICATE FILLINGS.*

BY DR. EDMUND NOYES, CHICAGO, ILL.

The time appears to have arrived when it can be affirmed that silicate fillings have acquired a positive and useful, and probably a permanent place in dental practice. Perhaps this has become so apparent to everybody that it is hardly worth while to mention but it has not been such a very long time that this could be said. Ten or fifteen years ago it would, perhaps, have been generally conceded that the use of porcelain had acquired a permanent place in general practice but we have seen a gradually diminishing use until it is almost limited to a few who have acquired special skill in making porcelain inlays, some of whom almost make it a specialty, and its use for jacket crowns, which are more frequently made than formerly. Whether there will be a similar rise and fall in the use of the silicate filling I will not venture to prophesy; suffice it to say that neither the porcelain inlay nor the silicate filling can fairly be called a *fad* for they both help to supply an important and urgent need in the practice of dentistry.

The chemical composition of the ingredients out of which a silicate filling is made is pretty well known to the chemists, but the makers of them profess not to understand perfectly the chemical character of the hardened material; the same is true of porcelain after baking. There can be no doubt that the chemical reactions taking place during the mixing of the powder and the liquid and subsequently in both the primary and secondary hardening have a determining relation to the laws that should govern the mixing, the insertion into a cavity and the care of the operation subsequently

*Read before the Chicago Dental Society, March 19, 1918.

required, and the makers of these materials have given detailed instructions which they insist must be carefully followed if the best results are to be obtained. These instructions are based in part upon a knowledge of the chemical reactions taking place and the time required for their completion, and partly upon observation and experience in the use of the material. The silicates contain many of the same ingredients as porcelain which accounts for their similarity in appearance. Dr. Vogt says the initial hardening is analogous to the setting of an oxy-phosphate of zinc cement. The secondary hardening is radically different and "seems to be due to the same general causes as the setting of Portland cement." "While the silicate is in the plastic state it is *not* hydraulic. This is due to the fact that the formation of the insoluble hydrated phosphates from the soluble acid phosphates requires some time for its completion. Hence in order to avoid the solvent action of moisture at this stage some precautions should be observed."

1. The tooth should be isolated by the rubber dam.
2. The cavity should be dry. These simple methods will prevent any solution of the soluble salts before they have had the time necessary to convert them into insoluble ones.

3. Inasmuch as the silicate undergoes a secondary hardening accompanied by a marked change in physical properties, in order to obtain the best possible results the filling should be coated with a varnish or other water-proof coating which will prevent moisture from interfering with its proper crystalization."

"One would not use a garden hose on a cement walk until at least twenty-four hours after it had been placed, so why should he permit water to come in contact with a silicate filling, the secondary hardening of which is analogous to that of Portland cement, until that filling had been allowed the same length of time for the final step in its hardening." The preceding quotation is from a paper by Dr. C. C. Vogt read at the meeting of the National Dental Association. Dr. Vogt conducted the experimental and research work at the Mellen Institute at Pittsburg which resulted in the production of the silicate filling material known as Certified Enamel. The hardening of a silicate filling does not appear to be a crystalization to any great extent and that is said to explain its translucency.

It is understood that this is to be a short paper, but it seems worth while to describe briefly the more important steps in the mak-

ing of a silicate filling. The cavity should be of retentive form, for at least two of the silicates in common use, Ascher's New Enamel and DeTrey's Synthetic Porcelain, are not sticky when properly mixed. Dr. Ames' Berylite and the new Certified Enamel are sticky and have some adhesiveness to the walls of the cavity but a fairly retentive form is desirable for these. The cavity margins should not be beveled; this material will not retain a feather edge as gold will. It is more like amalgam in this respect. Some authorities insist that all cavities should be lined with varnish and one writer assigns as a reason that too dry a cavity may absorb water from the filling, or if not dry enough may give up moisture to the filling, in either case to its detriment. Perhaps the point is too fine, and probably the question of cavity lining is not really different from what it is under amalgam or gold fillings and relates chiefly to protection of the pulp in deep cavities. If varnish is used the cavity margins should be trimmed afterward to make sure that no varnish remains on the enamel portions of the cavity walls. While the question of moisture either into or out of the cavity walls is probably too fine to be of practical importance, it is undoubtedly of great importance that the accurate balance and proportion of ingredients be preserved, especially as regards the water in the liquid and the possible absorption of moisture by the powder, and especially, for here the difficulty is greater, the absorption or the evaporation of moisture by the surface of the filling, either during the first setting or the secondary hardening during a number of hours after insertion. The bottles should be unstopped only long enough to get out what is wanted.

All authorities agree that the greatest care must be taken to have everything used in the handling of the silicates scrupulously clean. The mixing slab, the spatula, and the filling instruments must be cleaned with the greatest care. There are two reasons slight contaminations may interfere more or less with the chemical reactions in hardening and setting, and what is probably of more practical importance, very minute amounts of foreign matter may injure the shade of color.

The completeness of the chemical reactions in the filling require that the materials be very thoroughly spatulated (not merely mixed), for some time, and this can only be done sufficiently on a cold mixing slab, say from 55 to 65 degrees of temperature, if colder than 55 or 60 degrees it may prove painful in a sensitive cavity. By far the

best way to manage this temperature proposition is to use a square bottle with a thermometer in it, then you know what temperature you have got and it will stay cool longer than a slab. The most satisfactory plan is to have a hygrometer and a dew-point table. (The hygrometers are usually sold with a humidity table but it is a dew-point table that we want. They are supplied by Dr. Ames.) When nearly ready the assistant notes the difference between the wet and dry bulbs, finds the dew-point by reference to the table, and takes the mixing bottle to the wash bowl and fills it with water at least two or three degrees above dew-point. During that part of the year when there is no artificial heat in our offices the dew-point will often be found above sixty or even sixty-five degrees and I have known it to be above seventy. When as high as that it is desirable, if practicable, to postpone the making of silicate fillings till a more favorable time. If neither the hygrometer nor the mixing bottle with thermometer inside are used, the slab may be cooled under the cold water faucet or in ice water and then after thoroughly drying, breathe on it and if the moist area contracts, showing evaporation from the slab it is above the dew-point and may safely be used, but if the moisture from the breath does not show any drying the slab is too cold and a filling mixed on it would probably be spoiled. At best this method is a guess as to the temperature of the slab. If you are going to make silicate fillings at all why not equip yourself to make them right?

For mixing the ingredients a spatula of bone or ivory or hard glass may be used but I believe one of agate is much preferable. It is easily cleaned perfectly and is hard enough not to be scratched. One man in discussing this subject advised a mixing slab of agate for the same reasons. The convenience of the bottle with thermometer is important enough to counterbalance the slight disadvantage from the scratching of the glass by attrition from the spatulation. By far the best instruments for filling are those having tantalum points, though instruments of agate, bone, or ivory have been much used. It is desirable, if not indispensable, as in making gold or amalgam fillings, that instruments be of such form and size that they may reach all portions of a cavity. It was long affirmed that steel instruments must not touch the material till after it is hardened but lately it has been asserted that steel instruments may be used if kept smooth

and brightly polished. This is difficult for the material before it hardens tarnishes and rusts steel rapidly.

The material should remain on the mixing bottle till carried to the cavity. The natural warmth of the tooth will cause much more rapid hardening in the tooth than on the slab. It may be hastened still more by the application of heat but it is said to be desirable that hardening begin at the surface of the dentine and proceed outward and therefore if heat is applied, it should be to the tooth instead of the surface of the filling. For proximal cavities a simple matrix may be made with a strip of celluloid or glazed linen tape passed between the teeth and held on the lingual side with the finger. When the cavity is full, a little over full, the tape is drawn over to confine the filling, which may be manipulated under the tape for contour and contact point, and held firmly in place till hard, usually five minutes or more. The filling may then be roughly trimmed, leaving some surplus everywhere if possible (if the bite interferes there can, of course, be no surplus at that point.) The whole surface of the filling should be made as perfectly water-proof as possible by a coating of varnish or melted parafin to last at least a few hours. If there should be only slight defect in the waterproof coating the injury resulting may possibly be limited to the surface and removed in finishing. Probably slight changes in the material continue for weeks and months but are so slight as to be negligible and after about twenty-four hours, perhaps less time, it becomes hydraulic and is better for the moisture of the mouth. You have probably inferred this from the keeping of the synthetic shade guide in a bottle of water.

The final finishing should be done carefully and patiently, chiefly with rather fine carborundum stones or paper discs, cutting against the margins of the filling wherever practicable and not from the filling toward the tooth surface. Steel trimmers may be used to a slight extent if handled carefully. Final finishing may be done with fine strips, cuttlefish discs, and accessible portions with arkansas stones. Carborundum and arkansas stones should be kept wet and discs and strips lubricated with cocoa butter, parafin or oil vaseline. Great care should be observed to have this finishing accurately done. A slight protrusion of the filling may escape observation unless the margin is tested with a fine point.

I have had personal experience with only four of the silicate

fillings; DeTrey's Synthetic Porcelain, Ascher's New Enamel, Dr. Ames' Berylite and lately some trial of the new Certified Enamel. The first two of these have little or no adhesion to the cavity walls and must be retained in a similar way as amalgam. The Berylite and the certified enamel should not be spatulated so stiff as the others and show marked adhesiveness to cavity walls, but even for these it is better to give some retentive form to cavities and it is indispensable if there is to be any occlusal contact. The Berylite is used with great satisfaction by good porcelain workers for setting porcelain inlays and jacket crowns. If the joints in these cases can be water-proofed for twenty-four hours there would probably never be any dissolving out of the cement.

The Caulk people have made celluloid forms or matrices for moulding silicates for replacement of broken porcelain facings on crowns and bridges, and complete tooth forms for jacket crowns made entirely of silicate cement. These last for temporary use. Dr. C. H. Land of Detroit describes the manner of making these in the *Items of Interest* for July, 1917. A suitable form is fitted to the neck of the tooth, and the joint is waterproofed and celluloid form left on for twenty-four hours till secondary setting is accomplished. The celluloid form may be adapted to the occlusion while the cement is plastic.

Dr. Charles C. Voelker has read some very long papers on the silicates which were published in the *Dental Summary* in 1914 and 1916. He quotes Dr. Steenbock as explaining the translucency of the silicates by the fact of "The amorphous nature of the phosphatic precipitates in the silicate mix, as opposed to the widely current idea that a silicate mix is entirely crystalline in nature." None of the writers I have seen make so sharp a distinction between the primary hardening and the secondary setting as does Dr. Vogt, and Dr. Voelker seems to think the material may be practically insoluble very soon after the primary hardening, for he says that some fillings that were not protected after the rubber dam was removed appeared to do about as well as the others. The matter does not seem quite clear to me. Perhaps Dr. Ames in his discussion will make it so.

I am unable to bring you anything new on this interesting subject. My purpose is to try to persuade you to give this material the careful and exact technical treatment in every detail that the nature of it requires if uniform and satisfactory results are to be obtained.

TECHNIQUE OF ROOT PREPARATION AND PORCELAIN
JACKET CROWN CONSTRUCTION.*

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When the preparation of a tooth for a Porcelain Jacket Crown is brought up for discussion the individual who has never had experience in this line of work always asks, "Don't you find it difficult to control the severe pain?" or "Do you use conductive anesthesia?" Why this should be the first thought in the minds of many men has puzzled me considerably. Can it be that this type of work is totally misunderstood? Does anyone suppose that we try to do the work of the orthodontist and correct irregularities by this method? At least it is not so in my practice. The type of cases where I use this crown is where a crown of some type must be employed. Cases where some men use large mesio-disto-incisal gold inlays; cases of bad abrasion where the bite is to be opened; cases that result from accidents. The average case has had large gold foil fillings or porcelain inlays which have failed or by accident or wear the angles are broken away.

I have made and set hundreds of these crowns in all manner of cases,—for all types of patients and I never had a case where I failed to make the preparation and no one has ever complained of being subjected to an unusual degree of pain. I have never used analgesia in this work or any form of anesthesia. I am of the opinion that they are never needed if not absolutely contraindicated. For the reason that the tooth might be overheated and result in a hyperemia and inflammation which would lead to a pathological condition; and what is more to the point, is it logical to use conductive anesthesia or something similar, then turn a novice loose to do the delicate cutting necessary to properly prepare a tooth and the patient not able to respond? Those who have teaching experience know what would happen in the colleges if cavities were prepared under similar conditions. My point is that the average practitioner is in just as much danger as a student until he has mastered the preparation and has

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sufficient confidence in himself to execute it. If a man gets a start in the wrong line and has two or three failures he will probably lose confidence in himself and the work and will never take it up again.

The first consideration is a radiograph, even if the tooth is vital this is necessary if we are to regard the whole mouth as a unit. The particular tooth we wish to crown might be all right but one of the teeth on either side may be extracted for some reason and our tooth with the jacket crown on would then present another problem which might be embarrassing.

The removal of enamel from a vital tooth as we tried to do it years ago was the most painful and difficult operation in dentistry. The removal of enamel can be accomplished on any of the anterior teeth in ten minutes, if the technic is carefully followed. The ease in which it can be removed with little discomfort to the patient and without any anesthetic is almost a joke. The old idea that the stone should be kept cool is decidedly wrong. The use of extremely hot water was first called to my attention by Dr. A. F. Merriman, Jr., of Oakland, California, about three years ago and it works marvels. He has a device for applying a constant stream of hot water under pressure directed upon the tooth during the operation. The stream of water is constantly drawn away from the mouth with the saliva ejector.

With a one-half inch stone, cut about two mm. from the incisal. Use a one-half inch knife edge, Jim Dandy carborundum stone in a small mandrel, making a line cut from the incisal to the gingival, about one mm. from the mesial and distal on the labial and lingual. This cut is made in the enamel to the dentin but not into the dentin. Then with an enamel hatchet as a lever, break out the enamel. This will denude the proximal surfaces. Make another cut about one mm. in from the enamel margins as before and break away. Carry this procedure across the labial and lingual. Then with the end-cutting bur or plain fissure, square up the enamel that remains around the tooth and with enamel cleavers it will fracture easily. I have a special set of enamel hatchets, fifty-four in number, designed to reach any angle without laceration, but sufficiently strong to remove the enamel with ease. The trouble with most enamel cleavers on the market is that they are too large to use properly, without an injury to the gums, but many of the pyorrhea instruments make excellent enamel cleavers.

The enamel rod direction at the gingival under the free margin of the gums compels us to remove it entirely, if we are to have a perfect shoulder. Were we replacing it properly or not was a question. You can easily see that the thickness we remove and the amount we replace would have a bearing upon the tension given the soft tissues. I took a set of teeth and cut the crown off one mm. from the gingival line, measured each surface and cut off one-half mm. more. I found that the enamel varied in thickness upon each surface and this variation was constant. It is impossible to reproduce this variation in thickness in a single banded crown—even if the men knew what the different thickness of enamel on each surface was.

The Blue Island Specialty Company make a seamless copper band which must be ordered in extra length (about one-half inch). It is furnished in twenty-four sizes. Select one which will accurately fit the root at the gingival and is carefully trimmed to the curvature of the gum tissue. This is always done before the shoulder is cut.

The shoulder is cut with a plain fissure cut, No. 57 S. S. W., starting at the labio-gingival angle and cutting across the labial. Then start at the center of the lingual, cut to the mesial and through the proximal joining the labial shoulder. Start again on the lingual, cut to the distal through the proximal and join the labial again. The finished shoulder should be about one-half mm. wide, well under the free margin of the gums. A further refinement of the shoulder is made with a special set of instruments, cutting it so that it will incline inward and upward slightly toward the apex. This is an important detail.

Toilet of preparation is made with stones and paper discs. Carefully study the stress of mastication and shape the incisal surface so that you will have a plane at right angles with this force. Then with a fine sandpaper disc, well coated with vaseline, polish the surface of the preparation.

The preparation that I use presents no sharp angles except in the occlusal formation at the points that correspond to the occlusal grooves. I believe we thus have a stronger porcelain restoration than if we cut planes at right angles to normal stress of mastication at the junction of the occlusal and proximal surfaces, which can become cleavage points under certain conditions.

A careful study of the illustrations will bring out the require-

ments of a proper preparation. On the bicuspid and molars the cusp formation is carried out to overcome the various applications of forces in mastication and thus transfer the strain from the thin proximal surfaces of the porcelain to the preparation made in the occlusal surface at right angles to the applied force. This point was brought out by Dr. A. E. Schneider and is a vital one.

The selection of the shade should be made at this time, so that the porcelain shade-guide tooth can be placed in better relation to the proximating teeth. Wet the teeth and guide-tooth while selecting the shade. A chart can be made to note accurately any little peculiarities or defects which you wish to reproduce, by drawing outline of the labial surface, dividing it into mesial, distal and middle thirds,—incisal, gingival and center thirds. Any third may be further subdivided and the location of a given area recorded.

The impression of the root is secured by the use of the copper band which was fitted before the shoulder was cut, used as an impression cup. Fill with Kerr's modelling compound—dry heat over Bunsen and vaseline slightly, holding the finger over one end, press into position that will be apically of the shoulder—chill with cold water and remove. Into the impression is packed copper amalgam building a root on the preparation for convenience in handling. Some men use cement, but I prefer a metal. I have devised a split ring in which I can cast a root by taking impression in cement to which talcum powder is added to destroy its adhesiveness.

Before dismissing patient the root is covered with a temporary crown, made of white base-plate gutta-percha. If the tooth is vital cement it in position. It serves to protect the tooth from thermal changes and holds the soft tissues in their proper position.

The bite can be taken with a hard paraffin wax like S. S. W. "Tenex," or Kerr's compound. Bite with plaster impression is sometimes used.

To secure model—the reproduction of root preparation is polished with discs, having it smooth and conical toward the apex and placed in proper relation to the impression. Run up on the articulator. A hole is cut in the plaster model so that the root can be removed without destruction of any of the vital parts of the model. The shape given the root should never be round, as it is liable to rotate.

The matrix is formed by cutting a piece of .001 platinum foil

about one mm. longer than circumference of root at the gingival; it may converge toward the incisal and should be about three mm. longer than the distance from the shoulder to the incisal. The metal root is removed from the model and the platinum is laid against the labial surface. It is roughly conformed here with the fingers, then burnished to the shoulder with burnishers. Holding the platinum firmly to the root with the second finger and thumb, a triangular piece is cut from the mesial and distal incisal angles; this permits the central portion to be burnished over the incisal and down on to the lingual about one mm.

The burnishing continued around the mesial and distal surfaces conforms the platinum to the shoulder as well as to the surfaces. This will bring the ends well around the lingual. With a pair of pliers the ends are grasped and brought together, the excess projecting at right angles from the surface. Trim away all but one mm. then trim the left excess to one-half mm. with cotton pliers—fold the one mm. over the shorter projection and burnish down to the root. Remove, trim all but about one mm. beyond the shoulder toward apex. Reburnish the entire matrix accurately and you will have a matrix which will be a positive fit and will stand all the handling necessary.

On the shoulder we have four thicknesses of platinum, which is reduced to one by grinding with a fine stone. Otherwise, when the crown is finished and the platinum removed we should have a poor fit at that point. Test matrix to see if it can easily be removed before placing on any porcelain.

COLOR, THE CHIEF OBSTACLE AND ITS SOLUTION :

Unless I can show you how to broaden your sense of color selection, color reproduction will be of little value.

Color and not tooth anatomy is the barrier between the beginner in porcelain work and success. Most dentists have had instruction in dental anatomy, but few understand even the theory of color. Color is a science to master which one must give time to study and to laboratory experiments. Without a clear understanding of its principles, no one should hope to mix haphazardly and reproduce colors accurately.

This subject is a matter of more difficult acquirement than that

of form, which can be measured; its anatomical structure may be investigated.

The system of color depends upon physical measurements made by special color apparatus. Much confusion of color is caused by the inability of most people to express themselves in more than two dimensions—an appreciation of this can be had when, in the study of color nomenclature, we find a classification of names for more than four hundred greys. Unless we study this subject carefully all our sensations are included in the color solid and none by its scale of hue value and chroma.

Something is radically wrong when we find that men long in practice use from one of three shades in every case. So many have expressed themselves to me that shade so-and-so blends nicely in nearly every mouth. I do not think that all of these are color-blind as the law of averages would not permit of their number. The future will see color standardized. It will be taught in all schools and we will have definite symbols to express ourselves. Colleges of color will be established where those who wish to specialize in the arts and crafts will secure the proper training.

In the fine arts, the textile manufacturers, even the printers are giving considerable attention to this matter. It is the only means by which the knowledge of color will live.

In the past we find, in the study of art, that entire schools and ages excelled in color—while in other schools and ages, it is almost entirely lacking.

Education in this line begins when we recognize the names of certain hues, as red, yellow, green, blue and purple. Red is the color most individuals easily recognize—even savages recognize it and have a name for it. Distinction of color is slow at first. The most notable contrasts are recognized but the more delicate colors are lost. But after a time spent in exercise and experimental work the delicate colors will be more easily appreciated. The more time one spends in this work the more interest he will take in it and will apply his knowledge in many different ways. When this subject is mastered every color can be recognized, named, matched and imitated.

The first step is to study the theory of color and master its principles. Then mix porcelain as supplied by the manufacturers in various proportions with a pure white, carefully record and keep the buttons; follow this up with the various colors mixed in the same

way. Next study the physical nature of light,—how it travels, the absorption, refraction and reflection of light on different surfaces. Take a central incisor root preparation on a model, wrap three platinum matrices for the same root. Bake a gingival color of, say shade five, carefully measure the porcelain mesio-distally, labio-lingually and inciso-lingually, have the measurements the same on all three. Then add, say shade fourteen as the incisal color, measure as before and have all three identical. After they are baked they would match accurately as all three were made over the same root preparation on the same model. All three were baked together, each color was carefully measured as applied, they will be as near alike as it will be possible to make them. Take one and disc it as smooth as you can with paper discs. Mark one of the others with fine stones and a diamond-point, have the surface markings running mesio-distally. The third one mark in the same way but have the markings run inciso-lingually. Wash with spray bottle and compressed air, place all three in the furnace and glaze. The result will be three different shades due to the action of light on the surfaces. The crown with the smooth surface will be much the lightest due to the fact that it will reflect a solid beam of unbroken light. The prophylactic specialist who carefully polishes the enamel surfaces of the teeth takes advantage of this fact unconsciously. The patient believes the change is due to the removal of deposits and other material, but the fact is the change is due to the changing of a roughened surface to a highly polished smooth surface.

We cannot match a tooth accurately unless the surface of the tooth we replace acts upon the light similar to its mate in the mouth. We may have the correct colors to reproduce, but unless the surface is broken or smooth, as nature demands, our match is imperfect. If you do not believe this, try this experiment: Take one of your patients with two centrals that are perfect, the color is identical. Highly polish one with fine discs, silex, rouge and tin-oxid, then see what you have. The polished tooth is much lighter because the smooth polished surface throws back a solid, unbroken beam of light and the other surface has the imbrication lines of Pickerill or slight roughness which breaks up the rays of light. Another illustration of this is seen in the automobile lights. Most states and all large cities have laws or ordinances to dim the lights. The problem was solved by breaking up the surface of the glass in the headlight.

When I started to experiment with orange porcelain I had a special orange and pure white or colorless porcelain made. I carefully weighed and mixed the porcelain in an agate mortar and pestle, baking samples of each mix. The first mix was .02 white, .98 orange, and the second .04 white, .96 orange, etc., until I had fifty specimens. By using one of these for a gingival color I can accurately match any gingival color. I firmly believe that the color spoken of in dentistry as yellow in describing artificial teeth is not yellow at all, but orange. The results I have had will bear this out; other men in this same line of work are of the same opinion.

Expert porcelain workers can take six or seven colors and by various mixing reproduce quite accurately. But the beginner will find himself lost in the forest of doubt if he attempts it. We might say, take so much of number one, two, etc., by weight and mix—but this would necessitate the use of a balance scale to accurately weigh out and an agate mortar and pestle to thoroughly incorporate it. Then the danger of mixing in particles of dust and other impurities, which cause the bulk of trouble for the inexperienced. Few men would take the trouble to carry out the proper precautions—a guess as to the weights with incomplete incorporation would give the results we too frequently see.

The Justi high-fusing porcelain is the first step to set a standard of colors for the porcelain worker.

The colors are accurate and are to be used without mixing. The chart furnished gives accurate directions as to what color and where to use it.

To illustrate the use of the shade chart:

Shade No. 13 according to the shade guide matches the case. Reference to the guide chart shows No. 4 is the body and is placed on the platinum matrix in the position that would correspond to the dentin in the normal teeth—except in the gingival third where the full enamel contour is made. The balance is then built to full tooth contour with No. 13 and the result will be perfect reproduction of shade No. 13. The gingival third will have the full body color; the incisal third the full enamel color and the middle third a perfect blend due to the thinning out of the enamel color as it is worked to the gingival.

To illustrate variations from the chart:

Numbers 4, 5, 6, 21 and 23 are the body colors to reproduce any

shade on the guide. If, in selecting your shade, say No. 13 is good but is a trifle light at the gingival the next darker body or No. 5 could be used. In combination with No. 13 enamel it would result in a shade No. 13 slightly darker at the gingival.

The enamel for shade No. 7 is a pure white and could be mixed in any combination to dilute a color.

The first consideration is the material we work with. It is composed of Feldspar, Kaolin and Silex. The two latter will not change at a very high heat—Feldspar will liquify at the heat we subject them to in combination and bind the three together in the form of dental porcelain. To these three substances are added various fluxes which control the fusing point. The larger the percentage of the flux the lower the fusing point.

The color is regulated by the condition of precipitated gold, platinum, oxids of gold, titanium, cobalt, iron, etc.

The chemistry of porcelain we are interested only in a general way. Exact formulae could be given but they would be of little value—because the variation of silex for instance is so great in various parts of the United States that uniform results could not be secured by what to the inexperienced would be the same formula. I said that Feldspar, when heated to the degree we subject our prepared porcelain to, undergoes liquifaction—it does—but some grades of it cannot be liquified by the highest heat we can secure with our furnaces. When we understand and appreciate these facts, the solution is to use the manufactured powders which will best suit our individual purposes.

Decomposition by air and dust depends upon the content of alkali—the higher the percentage the greater the decomposition. Dust which would settle on the surface would become the center of disintegration; if the alkali percentage was low this would occur in spots and could only be seen with a microscope—if the percentage was large the disintegration could be seen with the naked eye and appear as large spots which have a tendency to cover the entire surface. The old porcelain workers who used low fusing porcelain will recall the difficulties they had when the enamel was placed on the surface before glazing—the numerous bubbles that would occur.

This was caused in a great measure by fine particles of dust that would settle on the surface or had been incorporated in the porcelain powders. Keep your porcelain powders covered and all unfinished

work under what is known to jewelers as a movement cover on a clean napkin. Keep the muffles free from dust.

Porous porcelain is also caused by baking too fast,—various gases which occur in porcelain during the process of baking which forms minute bubbles. To overcome this I prefer to place my material in a cold furnace and evaporate these gases slowly. The same trouble occurs in another way—low fusing porcelain can be made from high fusing by grinding and refusing.

If we grind or disc a tooth, crown or inlay, the small particles we grind away are of a lower fusing character and must carefully be cleaned away before the article to be fused is again placed in the furnace.

To overcome the shrinkage of the porcelain at the gingival can be obtained in three ways—by painting shellac over platinum on the shoulder, by using a thin film of inlay wax in the same position, either of which will burn out clean, leaving a space which will permit the platinum to be reburnished to the shoulder—before filling in with porcelain on the second bake. The other method is to cut it away with the packing instrument before the first bake.

The model is painted with amyl-acetate to prevent the plaster from absorbing the moisture from the porcelain. The first color, the gingival, is put on with the root in the hand, packing the porcelain to the greatest density, building up slightly beyond the incisal. The porcelain can be best worked by not having it so moist that it will run. Place the root in the model and lay on the incisal color, bringing the porcelain out to full tooth contour and occlusion—remove and add what is needed to the contacts. Carefully brush off loose particles from the carving and exposed platinum.

Another method of placing the porcelain is to wrap a piece of filter paper around the gingival and pour your gingival color into it—the paper absorbs the moisture and permits the porcelain to be carved; then from another piece of filter paper to the form of the tooth to be reproduced, which encloses the porcelain already carved; into which is poured the incisal color; after the moisture is absorbed carve to occlusion and anatomy. This method is not as accurate; I believe better results can be obtained by having positive control of your colors and place them where you want them.

Many different materials have been used to mix with the porcelain powders to make them workable. Milk, flour and water, alcohol

and even vinegar, all of them will work. For experimental work in making test buttons use a saturate solution of starch and gum tragacanth, which is made by the addition of two ounces of tragacanth to two quarts of water; let it stand twenty-four hours and then strain. The porcelain is first mixed with the starch solution, then add the gum tragacanth; you should then have a porcelain of the consistency of putty. Pack it in some form of split mould and bake to what is known as a carving biscuit which is about 600 degrees in the furnace. Remove it and mark it with a porcelain pencil (Faber 351), if you make a record of what it contained these buttons will be invaluable to you.

Examine the furnace each time before using. Look at the termo-couple connections. If it is poor the registration of heat will not be accurate. If the furnace has been moved or handled, see if the needle that registers on the pyrometer is on the figure 0—if not, set it with the corrector. The S. S. W. Electric Furnace with pyrometer and small muffle is the best for this work. The object to be fused is placed in the furnace with the current off. This is a precaution that might save trouble if the current were on. If the tongs were to touch an exposed wire it might result in burning out the muffle. Throw in the knife switch—have the Rheostat lever on button No. 1 when 1,500 degrees is registered on the pyrometer—close the furnace door. At 1,600 the Rheostat lever is advanced two buttons at a time until 2,450 degrees, which should be reached in about eight minutes. If the muffle is new the lever would probably be on button seven, but as the muffle becomes older it may be necessary to go as high at button twelve or thirteen. If you are in haste, it is perfectly safe to remove the crown at 2,000 degrees, but be careful not to touch it with the furnace tongs. When the crown has cooled sufficiently to handle, place it on the root and reburnish the gingival. Pack the gingival porcelain between that which is already fused and the shoulder. Moisten the model again with amyl-acetate and place crown in the model—if any more porcelain is needed for contour and occlusion it is now added. Place in the furnace and bake to 2,490 degrees as before. Remove from furnace and place on the model. Examine carefully contact and occlusion.

The next detail will determine whether you have a good or a poor porcelain crown. You remember the platinum matrix overlapped the shoulder toward the apex about one mm. for strength.

The porcelain is baked flush with this platinum and the platinum is .001 larger than the root; therefore, the finished crown will be that much larger than the root in the mouth—unless it is corrected. Take a seven-eighths carborundum disc and cut away the porcelain and platinum around the gingival with the crown on the metal root. Clean the crown carefully by using compressed air and spray bottle—follow this up by a good stiff brush and Dutch Cleanser.

The next step is to test the fit in the mouth. To do this do not remove the platinum. The crown is placed in position and a No. 17 explorer (which is a pull explorer) is passed up under the free margin of the gums beyond the shoulder and drawn incisally, passing around the root—if it catches the porcelain, is trimmed again until it is perfect. Place in the furnace and carry to 2,500 degrees. The matrix is removed by putting in water—then, with a fine knife turn over a small piece at the margin—grasp with “K” tweezers and it will usually peel out in one piece.

Roughen the interior slightly with a fine stone and set with Flecks Cement, holding the crown in position with slight pressure. The bulk of the cement is removed with a straight explorer. The fine particles of cement are removed by a very fine strip, passing it through the mesial around the lingual and back again through the distal. Reverse this till the tape has entirely circled and polished the junction of crown and root.

Before using the strip, the saw-edges should be removed by drawing it over a fine stone. If this precaution is observed, the soft tissues will never be injured.

The reason teeth look so artificial is due to the absence of dentin stains in the anterior teeth, which may be anything from a modified orange to dark brown, and the lack of the fine lines of fracture in the labial surface, which usually absorbs some coloring matter. These can be supplied on the labial surface by using an instrument I will show you, which I call a diamond-graver. I had it made specially. It is a black diamond, mounted in a pencil-like holder. It will cut a fine line anywhere, which is filled in with brown porcelain. The incisal surface is cut to proper angle. With diamond drill cut a hole about $1/32$ deep, near the mesial and distal angles, then unite the two with a stone. This will approximate the area of dentin exposed by wear. Fill it in with a modified orange, a No. 23, or special brown. The pit-fissures and grooves on the occlusal sur-

faces of bicuspid and molars, after the case is ground to occlusion, are grooved out with diamond graver and diamond drills, and then filled in with special brown.

About ten years ago I started to stain teeth with the Lennox china colors, but care had to be exercised not to polish it off at the lathe. Some did much better service in the mouth than others, but eventually all were brushed off, or probably dissolved in the saliva. Most of you may not know it, but glass is slightly soluble in water and it may be that the thin colors which I put on went into solution in later years.

I next tried the S. S. W. and Ash's Mineral stain with better success, but in jacket crown work when I wanted to stain the occlusal surface, the area was always where the porcelain was the thinnest. I doubted whether it was advisable to reduce this more by adding a stain, the strength of which was doubtful. I baked up a crown, using one of the mineral stains, and tested its strength. I never used it again on the occlusal. The thought then occurred to me—why not get porcelain, made the same as the porcelain I was using, but colored to match the stains? I had them made and started to test them. They proved satisfactory in every way and I used them in most cases.

One set of special stains has a fusing point of 2,450 degrees, which is to be used on any of the different manufacturers' teeth. First modify it to suit the case and glaze it, then add your stain where it is needed and bake at 2,450 degrees.

In the slides I will show some of the instruments I used to measure the shrinkage and fusing point.

Do not try to carry the anatomy of the teeth in your head, but work like artists. Have a model before you. I have hundreds of fine specimens of all the teeth and use them constantly.

The following formulae will be found to be of value for producing stains on the incisal surfaces of the teeth:

Cork Color: White, two parts, yellow one part, orange one part.

Orange Brown: Orange two parts, with three parts of brown.

Amber Yellow: Orange $\frac{1}{2}$ part, brown $\frac{1}{2}$ part, black 1 part, white added to get desired tint.

Buff: White 2 parts, yellow 1 part.

Dull Yellow: White 4 parts, yellow 5 parts, green 1 part.

Orange Brown in Hue: Mix 1 part of black, 1 part of white, 2 of orange.

Very Dark Brown: Mix 6 parts of black, with 2 parts of orange, and 1 part of yellow.

Amber Brown: Mix 6 parts of brown, 4 parts of yellow, 2 parts of orange.

Tan: Mix 1 part of brown, 3 parts of yellow, 5 parts of white.

Bronze Brown: Black 5 parts, orange 1 part, green 1 part.

Straw Yellow: Mix 3 parts yellow, 1 part brown.

PRESIDENT'S ADDRESS*

BY J. E. HINKINS, D.D.S., CHICAGO, ILLINOIS.

Your President, searching for a topic of value and interest to the Society, selected one that seemed very favorable and spent some time in preparing a paper which promised a warm discussion, but after a second or third reading and a closer contact with the working conditions of the Society, it began to be forced upon him that there was one subject of such vital interest to this organization that it overshadowed all others. So, in presenting these thoughts for your consideration, an endeavor has been made to put a problem heretofore ignored (except by the Executive Council) before the Society at an open meeting, in the hope that out of the discussion, the solution may be made, with results so far-reaching to the life and work of the Illinois State Dental Society, that the year 1918 may be an epoch-making era. In the citation of facts, your President makes no criticism, at the same time, he makes no apology for presenting a true picture of conditions in the Society that demand your earnest attention and best efforts at correction. It will not do for our state society to rest on its past laurels.

We must make our meetings of such vital interest that our members will leave their golf sticks at home, and so they shall feel that they cannot afford to miss a session. How shall one accomplish this? The methods applied so successfully in Oklahoma would not fit in to good advantage in Illinois, neither would the Michigan plan of post-graduate work. But we have the reputation and the

* Read before the Illinois State Dental Society, May 14, 1918.

brains, and we should live up to our past. If we do not, the time is not far distant when we shall retrograde. The all important question now is our finances, and I shall proceed to give them to you, for the Illinois State Dental Society was bankrupt in January, according to our Treasurer's report.

Several years ago an annual report showed \$5,745.49 in the Treasury, and this was the starting point of various misconceptions. This balance was more apparent than real and was so indicated in the reports of the officials.

For the sake of comparison, we herewith present the sum totals of receipts, expenditures, etc., for the five-year period from 1912 to 1916, both inclusive, taken from the reports appearing in the bound Transactions for the respective years.

Receipts, expenditures, and balances of the Illinois State Dental Society from 1912 to 1916 inclusive.

		Gain.	Loss.	Balance in Treasury.
				\$2,218.40
1912—Receipts	\$ 4,950.94			
Expenditures	3,899.19	\$1,051.75		3,274.51
1913—Receipts	5,588.90			
Expenditures	4,634.90	954.00		4,373.51
1914—Receipts	12,627.86			
Expenditures	11,360.05	1,267.81		5,745.49
1915—Receipts	5,673.61			
Expenditures	7,809.66		\$2,136.05	3,731.49
1916—Receipts	6,315.47			
Expenditures	6,076.52	238.95		4,049.94
			Loss.	
Totals	\$3,512.51		\$2,136.05	
Net gain	1,376.46			
Average gain per year	275.29			

The discrepancies in the Secretary's and Treasurer's reports arise from interest received, accrued interest, commissions in placing funds, etc., which are not taken into account in figuring yearly gain or loss, and which appear only in the Treasurer's report. 1914 was the year of the Golden Anniversary meeting. The 1915 report carries about \$1,600.00 expense incurred during the 1914 meeting. This item reduces the \$5,745.49 total to \$4,145.49.

To bring the figures approximately up-to-date, herewith is appended the reports at the Quincy meeting.

	Loss.	Treasurer's Balance.
1917—Receipts	\$ 7,843.38	\$4,049.94
Expenditures	10,126.63	\$2,283.25
		1,802.54

The increase in receipts for 1917 is due to an advance of \$1.00 per member for National dues to cover subscription to the *National Journal*, which began appearing monthly. Also in an item of \$500.00 advanced by Dr. Wm. H. G. Logan to enable payment of donation of \$1,000.00 to the Black Memorial Fund. (This loan by Dr. Logan was paid January 1st, 1918, when dues began coming in.)

The increase in disbursements is due to two donations of \$1,000.00 each to the Black Memorial Fund and the Research Institute; items covering cost of moving secretary's office to Peoria; additional salary of \$150.00 to the then assistant secretary covering a six months' period while the new secretary familiarized himself with the work; purchase of some necessary equipment, and in general to great advance in price of print paper, printing, and in fact every form of supplies required in the secretary's office.

We have presented the figures of the last six reports, and while space will not permit detailed analysis we earnestly request the members to study the items in the reports as they appear in the transactions.

In the 1917 reports the two items which reduced our surplus by about one-half are the donations by the society to the Black Memorial Fund and the Research Institute. Surely we have not a single member who would recall these donations! We dislike to think we have any.

It will be noted that the balance in the treasury with which to begin the fiscal year of 1917-1918 following the annual meeting was \$1,802.54. All the expenses of the annual meeting, secretary's honorarium, appropriations, if any, are paid immediately from this balance. By June 1st, \$1,650.00 had been paid out, leaving a meager sum in the treasury of \$150.54 to carry us to January 1st.

The amount of dues collected after the May meeting are nominal and wholly inadequate to pay the current expenses which include the assistant secretary's salary, office rent, the *Monthly Bulletin*, other printing, postage, supplies, etc. Your officers studied the situ-

ation and eliminated what they deemed unnecessary expense. These included abolishing the annual certificates; advancing the price of the bound transactions to \$1.00; the cost of the transactions mailed to the members exceeds this amount, the net loss during 1916 being \$238.82.

I would respectfully recommend that the transactions this year be furnished the members at cost.

The officers would have been compelled to anticipate the 1918 dues by borrowing money had it not been for the voluntary action of the Chicago Dental Society in paying fifty cents additional for each member into the State treasury, and this tided us over. Without going into details it may be stated that the Chicago society, for reasons that were deemed adequate at the time, paid fifty cents per member less than the down-state. All are on an equal paying basis now.

All will agree that it is not fair to the society or its officers that the great dental organization of a great state should annually face the prospect of an empty treasury during the opening months of its fiscal year. It can neither carry on its great work successfully nor fulfill its mission, thus hampered. Something must be done. Two factors are of utmost importance. The first is to keep 50 cents out of the National and the other raise the dues. A State membership committee is waging a campaign for new members. That will help some, but the society should have more than a working surplus. The other, and more important factor, will unfold itself presently.

The by-laws of the State Society place the dues at \$3.00 per member. When the National Dental Association was reorganized the State Society, to encourage the affiliation of its components, agreed to pay fifty cents, one-half of the National dues, for each member the first year after the reorganization. Through some unfortunate circumstances this custom has continued, thereby, in effect, reducing the State Society dues to \$2.50. Accordingly, the State Society has, up to the time of the Quincy meeting, paid out of its treasury for National dues the sum of \$1,781.00 and is at present doing the same thing—which money rightfully belongs to the State Society. I would recommend the discontinuance of the fifty cents per annum of each member to the National Dental Association, as this was only a temporary provision made by the society. This would give us approximately \$1,050.00. It would help the incoming

officers very materially in furnishing them finances with which to carry on their work. The dues now collected are apportioned as follows: National, \$2.00; Research Fund, \$1.00; State, \$2.50; Component, variable, from 50c to \$1.50.

As previously stated, the by-laws provide for dues at \$3.00. This is only a nominal sum compared with the dues of a number of other societies. The Executive Council has voted to consider re-establishing this amount at the Bloomington meeting.

The Oklahoma State Dental Society costs each member attending the meeting \$31.50 and a program is prepared for a six-day meeting, a veritable post-graduate course in selective studies. Several of the Eastern Societies have a \$10.00 yearly dues.

MEETING PLACE.

It has been apparent for several years to a number of members of the society that there are but three available places in which to hold our annual meetings, namely, Chicago, Peoria and Springfield. At one of the Executive Committee meetings of the Chicago Dental Society it was suggested—and probably put in force—that for the next five years, or so it would be desirable to hold the Chicago Clinic in conjunction with the State Society meeting in that city, and in the alternate year the Chicago Dental Society would hold a one-day meeting in January, the State Society that year meet at Springfield or Peoria, and every alternate year hold a meeting in Chicago. If this should meet with the approval of this society, it would give us ample hotel accommodations and excellent railroad facilities for members residing in various parts of the State. I have no doubt that this union meeting of the Chicago Dental Society with the Illinois State Dental Society would be largely attended. I would suggest that we close the meeting Thursday night and on Friday let the members attend their alumni meetings, so that they would be ready to go home Friday night or Saturday.

If such arrangements could be made, we would have fewer adverse criticisms, such as we had last year at Quincy with reference to insufficient hotel accommodations and inadequate railroad facilities.

NUMBER OF MEETINGS.

There were 189 dental society meetings held during the year in Illinois. This includes our State Society, its components, the Chi-

ago Dental Society and its component branches, the Dental Research Club and the Odontological Society. The Dental Research Club holds two meetings every Thursday for a period of nine months in the year. It holds a monthly business meeting on the second Tuesday of each month besides, making a total of 79 meetings.

DENTAL LEGISLATION.

The Society is to be congratulated on the excellent legislative work accomplished by the committee representing the National Dental Association, in elevating the members of the Dental Corps of both the Army and Navy to equal rank with physicians in those services. It is very essential that we as a profession be progressive, wide-awake, and keep our profession abreast of the Medical profession in order to merit the honor that has been conferred on us.

HOSPITAL FOR DENTAL AND FACIAL SURGERY.

A little over a year ago Mrs. Archibald Freer organized and raised \$10,000.00 for a dental and facial surgery fund to aid the American Hospital at Neuilly, France. We, as a state society, ought to go on record as commending Mrs. Freer for what she did for this hospital. Now that the United States Army has taken over these hospitals, Mrs. Freer is devoting her energies toward raising a fund to establish another hospital in Paris, which is to be continued as long after the war as necessary, and which is to have a department of dental and facial surgery. This is the time to take steps toward the establishment of a like enterprise in this central western state. Already a committee has been appointed by the Odontological Society of Chicago. Accordingly, I would recommend that a committee from this Society be appointed to confer with Mrs. Freer and a committee from the Odontological Society in regard to this movement.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

As a member of the committee for this League for Chicago, in the selected draft last year, I feel that some criticism is due us, because on account of lack of organization we have not done as much work for the Army as we should have done. But owing to the fact that there were 88 divisions in the Chicago exemption boards last summer, and considering the great difficulty in securing names and selecting men in the state, it would have required our going to

Washington and taking out authority to the Adjutant-General at Springfield to secure the names in Chicago. We did not have time before the draft last fall to do this. The newspapers published advertisements for us and we sent out cards to the men throughout the cities and state, and something like 1,500 men responded, stating that they would agree to give so much time and material to take care of the soldiers' mouths. One night, at the Northwestern University Dental School, there were 65 dentists with their assistants present ready to handle any number of soldiers that came in, but only three or four appeared. Equipment was provided to do a large amount of work, but the men did not present themselves. Throughout the state the members of component societies have done splendid work, and large numbers of teeth have been filled and extracted, and dentures made. It is very important for all dentists who are doing this work to make reports of what they do. This has not been done in many instances, consequently Illinois does not show up to as good advantage as it should as compared with other states. But the state is well organized and Dr. G. N. West deserves a lot of credit for his untiring work.

LIFE MEMBERS.

After a member has paid his dues continuously for 25 years, he is presented with a certificate of membership which releases him from the payment of dues as long as he lives. This is considered a great honor and one which every member should strive to achieve, but inasmuch as our Treasury has been depleted, by possibly hastily considered measures, I would recommend that all active life members be made an auxiliary to the State Society to act as a quasi judicial body with regard to the appropriation of funds, other than those for the actual work of the Society, so that our treasury will not become depleted to the extent it has been in the last year or so.

MEMBERSHIP COMMITTEE.

A new committee on membership was appointed last year, of which Dr. H. W. McMillan is Chairman. He divided the State into seven districts, with a superintendent for each district, as follows:

1. Northwestern district, A. M. Harrison, Rockford.
2. Northeastern district, H. F. Lotz, Joliet.
3. Central district, W. A. Johnston, Peoria.
4. Central western district, W. L. King, Quincy.

5. Central eastern district, L. E. Coonradt, Decatur.
6. Southern district, L. B. Torrance, Chester.
7. Chicago district, A. M. Hewitt, Chicago.

The chairman and superintendents have done splendid work, but they have been handicapped on account of finances. It is to be hoped that when the finances of the Society are in better condition, more effective work will be done by this committee.

The members of the Society should do all in their power to aid this committee in its splendid work.

If possible, I would suggest that the superintendents of these seven districts get together with the chairman at this meeting for the purpose of discussing ways and means for carrying on a membership campaign.

The chairman of the committee has asked for suggestions and criticisms in order to build up a strong and efficient organization. Sixty-seven new members have been received from down state and 242 from Chicago.

REPORT OF LIBRARIAN.

Our librarian has done good work. He has albums that will hold a thousand photographs. He has been working diligently to secure photographs of all the ex-presidents and members of the Society and to classify them. He has also obtained a complete file of the transactions from the time of organization of the Society to the present, and has deposited them in the library vaults at Springfield. It is hoped that the librarian will continue with his good, economic and forceful work. The first albums that he presented to us would have cost from \$250.00 to \$300.00, but after devoting more time and energy to the work he has secured better albums, with more durable covers, that will hold a larger number of photographs, for less than \$100.00.

THE BLACK MEMORIAL.

Illinois is honored this year in being the host to the National Dental Association, which will hold its twenty-second annual session in Chicago, August 5-6-7-8-9. We are further honored by the fact that our distinguished fellow member and co-worker is the president of the National body. I refer to Colonel W. H. G. Logan, of Chicago and Washington. It is for every member of the Illinois State Dental Society to show his appreciation of these honors by

attending the National meeting and doing whatever he is called upon to do, to the end that the reputation of our great state may be augmented.

One day is to be set aside and known as Illinois day, at which time the Black memorial will be unveiled.

I wish to thank all the officers for their hearty co-operation and untiring efforts during the year, and especially do I wish to thank the Program and Clinic Committees for the work they have done, considering the short time in which they had to do it and the further handicap of limited finances.

I had prepared another address for this occasion, but after much thought and mature deliberation I decided it would be more appropriate, and would enhance the interests of the Society to a greater extent, to direct your attention to the critical condition in which we find ourselves by a greatly depleted treasury, and I sincerely hope that the suggestions and recommendations I have made will be adopted and put into effect.

CONDUCTIVE ANESTHESIA*

BY F. L. MILLER, D.D.S., LONDON MILLS, ILL.

Since the beginning of the world, the necessity for any certain thing has always been instrumental in bringing about its production. People are not anxious to voluntarily submit themselves to pain. The elimination of pain, in any degree whatever, has always appealed to the dental profession, because, from the very nature of the service it renders humanity, it daily demands a juggling of two large branches of the Fifth Cranial Nerve.

Cocain was the favorite drug for many years, in local anesthesia, but it has many disadvantages, principally its toxic effect and the fact that boiling often rendered it ineffectual. As a result, various substitutes were produced which were tested out by such men as Braun and Bier, who conceded Novocain to be the best. It has much in its favor when compared with Cocain. It is only one-seventh as toxic, has little, if any, irritating effects on the tissues, is

*Read before the Sangamo-Menard County Dental Society, March 14, 1918.

easily combined with suprarenin, can be boiled, and yet has all, if not greater anesthetic properties than has Cocain.

Dr. Buckley made the statement last May in Quincy that had Cocain been handled with the same scrupulous care we now give to Novocain, it would not be in such bad repute today. Some very advanced men in both dentistry and medicine are at the present time, injecting solutions of Cocain into the nerve trunks for Conductive Anesthesia. Personally, I hope I never have to use Cocain again. I had, while using it for conductive work on the start, all the cases of "air hunger," "rapid pulses," and "near collapse," I care to handle in my own office.

The minimum equipment required consists of two syringes, one mounted with a 26 and the other with a 45 M. M. Iridio-platinum needle, a graduated porcelain dissolving cup, a distilled water container, sterilizer and a glass receptacle for extra needles and supplies.

The Fischer syringes are not obtainable now, but the "Tag" syringe answers the purpose as well. The requirements of the syringe used are that it must be all glass and metal. Leather washers *cannot* be sterilized and any syringe of which they form a part, should never be used in making a deep injection.

The Iridio-platinum needles are expensive at first but are safe because they do not rust, they are not easily broken and can be passed through a flame the last thing before an injection is made. Two syringes are used because it saves time, where a change of needles is desired. The mounted syringes and dissolving cup are kept immersed in a glass sterilizer with absolute alcohol as the sterilizing agent.

Each solution is prepared after the patient is in the chair and the amount needed has been determined. Stock solutions will not do as they become unstable in a very short time. The dissolving cup should be washed and the mounted syringe aspirated with distilled water, to remove all traces of the alcohol or sterilizing fluid, whatever is used. Care must be used that the solution is not drawn into the syringe while it is too hot or the glass barrel will be cracked, which means a new barrel and plunger each time as they are ground to fit each other. At any rate, the solution should not be used while it is too warm—it should be near the blood temperature.

An objection has been raised in regard to the breaking of the needle, resulting in its loss in the soft tissues. The needle should

never be completely buried, then if it breaks it can be withdrawn by pliers because the breakage will always occur at the hub.

I understand there is a new needle on the market. It should be good as it has a small phlange attached close to its hub which prevents its penetrating too deeply. I use the Novocain-Suprarenin tablet E almost entirely but also have the T tablet which contains less suprarenin and is sometimes indicated if the patient is just recovering from a sickness or a severe operation. The E tablet will produce a deeper and more lasting anesthesia.

I am informed that the Parke-Davis people have produced a very satisfactory substitute for Novocain known as Apotheresine. The reports I have in regard to it are good. Its users claim that it does the required work and produces no toxic effects. I have not used any. The New York importers of Novocain inform me that they are now manufacturing the drug in the United States and that as soon as the Government orders are filled, they will be able to supply the profession.

An exact knowledge of the Oral Cavity is essential for conductive work. I am quite sure I made the mandibular injection at least a dozen times on a dry specimen of the mandible before I made it on the first patient. It helps in giving one a mental picture of the objective point, also it fixes in the mind the desired depth you wish to penetrate the tissues.

In the conductive work, four injections will cover the field for dental operations. The Zygomatic and Infra-orbital, in the Maxilla, the Mandibular and mental in the Mandible. The results of conductive work in the Maxilla are not as satisfactory as in the Mandible, owing to the fact that the anatomy of the Maxilla varies so much.

The Maxillary Nerve comes from the foramen-rotundum, entering the spheno-maxillary fossa. The posterior-superior alveolar rami are given off just before the nerve enters the infra-orbital canal. They are two or three in number and supply the buccal portion of the gum, mucous membrane of the cheek and the molar teeth.

The middle superior alveolar ramus is where the trouble comes. It is given off just before it enters the infra-orbital canal, or from the infra-orbital nerve at its beginning. It joins into the superior dental plexus to supply the bicuspid teeth. The variation of this

branch is what causes the trouble. It is even claimed by some anatomists that there is no middle branch of this nerve.

The anterior superior alveolar ramus is the largest and is given off the infra-orbital nerve just before its exit through the infra-orbital foramen, anastomosing with branches from the middle superior nerve supplying the cuspid and incisor teeth. In making the injection to reach this anterior branch, the infra-orbital foramen is used, but the solution is not brought in direct contact with the nerve. It is necessary to work the solution back into the canal a short distance, which can be accomplished by massaging the outside tissues over the foramen for a few minutes, thus working the solution back to the desired place. Results from the infra-orbital block are very satisfactory. (However, one rarely needs to use conductive in the Maxilla, except in the molar region where the bone is quite dense, all dental operations can be accomplished by the infiltration method because this bone is porous to a much greater degree than is the mandible.) Cavities can be prepared, teeth extracted and ground away sufficiently to receive shell crowns, by infiltration. Pulpas in the six anterior teeth can also be extirpated immediately but for pulp extirpation in the bicuspid and molars after you make your exposure which can be done without pain, you usually need pressure anesthesia to finish.

In some very few cases, Conductive Anesthesia is indicated in the Maxilla. The infra-orbital, where you wish to operate on a central, lateral and cuspid at the same sitting and avoid the three injections necessary for infiltration. Or both the Zygomatic and infra-orbital, should you wish to remove all the teeth for a plate which would also necessitate the posterior palatine and incisive injections to take care of the soft tissues of the palate. In the latter case, however, seven injections are necessary and unless the patient absolutely refuses, it would be better to use Nitrous Oxid.

A summary of the work in the Maxilla can be made as follows: For dental operations use to anesthetize—for molars and bicuspid, the Zygomatic injection; for incisor and cuspid—the Infra-orbital injection; for surgical anesthesia which includes extracting use—for molars and bicuspid, Zygomatic and posterior palatine injections. For incisor and cuspid use—Infra-orbital and incisive injections.

The Conductive method in the mandible is an absolute success which is fortunate because it is needed here so badly. On account

of the density of this bone, the infiltration method was never a success except in the incisor region, where it is somewhat porous. It can be used for the four incisors, and that is all.

The Mandibular Nerve makes its exit from the skull through the foramen ovale and immediately divides into two branches—an anterior and posterior part. The Buccinator Nerve is the only one that need be considered of the anterior part. The posterior part consists of only two branches, the Lingual and Inferior-alveolar nerves, which are the ones we have to deal with. The technic that has been worked out for blocking these nerves is perfect.

I have omitted describing any technic in the maxillary region because if you are interested, you can get that in detail from the text-books of either Fischer or Thoma. However, I would like to give more time to the mandibular and mental injections. They are fine and we have two large foramina to help.

For the mandibular, first, find the external oblique line of the ramus, then the internal oblique line, and place the tip of your index finger in the depression between them—the post-molar triangle. Keep your finger in that position and draw the tissue taut, paint with iodine, use the syringe mounted with the long needle 45 (M.M.), pass point of same through a flame then insert until you feel the internal oblique line. This will mean that the barrel of the syringe lies over the first bicuspid of the opposite side. Push the needle slowly forward, changing the direction so that it is parallel with the ramus, depositing just a little of the solution as you progress. When the needle is about halfway in, deposit one-third of the solution which will take care of the lingual nerve, then advance the needle until you reach the foramen, caution being used to avoid injecting into the heavy muscle which covers the Pterygo-mandibular space, and inject the remaining two-thirds of the solution. Use two C.C. for both nerves. Move the syringe backward and forward a trifle while injecting to avoid depositing the solution into a blood vessel.

The penetration of the membrane by the needle at this point is practically without feeling and it can be accomplished nicely on patients ranging anywhere from five to seventy years of age.

In five minutes, the patient will experience a tingling sensation or numbness of that side of the tongue and lip which proves the success of your injection. Complete anesthesia occurs in from fif-

teen to twenty minutes and lasts from one and a half to two hours. You can operate safely on the three molars and second bicuspid and in favorable cases, to the median line. To be sure of anesthesia anterior to the second bicuspid, you may have to use the mental injection on the opposite side, due to the anastomoses of the nerve endings from the other side, or if you want a clear field for the entire sixteen teeth, you may use both right and left mandibular injections, and right here, you experience that "grand and glorious feeling," described by Briggs, the cartoonist. For example, you have a patient with a row of cervical cavities so tender that he has been unable to use a toothbrush—you can prepare these cavities just as quickly as the burs will cut them out. Or if the patient has a pulp exposure, even in a molar, you have ample time to place your rubber dam, sterilize your cavity and remove the pulp, enlarging the mesial canals with Buckley's phenol-sulphonic compound. One can remove all the pulp tissue, place a dressing of clove oil or dentinol, dismiss the patient and upon his return, fill the canals and go ahead with a permanent restoration, eliminating the discomfort and soreness usually accompanying the arsenic treatment, to say nothing of the time and visits saved. Two visits will be all that are necessary in 90 per cent. of the cases.

Another reason why it is more successful than arsenic or pressure anesthesia is that, after applying the dam, you can remove all the decay and sterilize your cavity thoroughly before you use a broach and carry any possible infection to or beyond the apex, which I firmly believe is the cause of a large percentage of infection in root canal work.

But remember that it requires a deeper anesthesia to extirpate a pulp than it does to extract the tooth. If you are going to extract any of the lower molars, the buccal nerve must be anesthetized either by the conductive method, which is done by starting your injection at about the apex of the mesial root of the first molar, or you may use infiltration directly into the gum tissue. The injection for the buccal nerve is not a bit pleasant.

The most pleasing results obtained from all conductive work is in extracting lower third molars. The more difficult the impaction the more it is indicated. You have the entire co-operation of the patient, plenty of time and space in which to work, no mouth props in any way, almost a bloodless field, and no danger of foreign matter

being aspirated into the trachea. The time and added expense of a hospital case, the usual unpleasant recovery from the general anesthetic is avoided and, last but not least, the operation is painless, if the field has been properly prepared. One objection to handling these difficult cases in the office instead of the hospital is that the patient is apt to consider it in a class with the ordinary extraction, which interferes with the size of your fee.

It is in these cases that one has to combat the psychic effect, and I want to say right here, that to be successful in the use of either conductive or nitrous oxid anesthesia, one must have a good understanding of psychology. Eliminate the word pain from your vocabulary while in the office. Your patient will hear noises and see your instruments while you are operating and you will have to be absolute master of the situation. Remember that he does not know as much about the work as you do and if he has never had conductive used before, take time to tell him what you are going to do and assure him that it will not cause him discomfort. It is necessary that you have complete confidence in the anesthetic and yourself or the patient will not have the proper confidence in you.

At the present time in my office, I have my conductive equipment situated in front and to the right of my chair. I intend to change this arrangement because of the psychic effect. I plan to place the entire outfit back of my chair, out of sight of the patient, and have my assistant prepare the solution, fill the syringe and hand it to me ready to use, with the exception of passing the needle through the flame.

The mental injection is used, if you do not care to operate posterior to the first bicuspid. The foramen is found below and between the roots of the first and second bicuspids. This injection is not difficult but the initial puncture of the tissue by the needle causes more discomfort than does the mandibular injection.

For the incisor region of the mandible, the infiltration method is good and all that is necessary. If you want to operate on all four of the incisors at the same sitting, insert the needle to one side and near the median line, penetrate a distance that will bring you to the floor of the mental fossa, deposit one C.C. of the solution, withdraw the needle partially and penetrate the other side, leaving the same amount there. By this procedure, you eliminate a second puncture of the tissues.

In conclusion, there are a few points I have been unable to classify: Should you ever need an antidote, in case of collapse, Dr. Logan says that in Germany, camphorated validol is official. In this country, experiments have proved that ether is the best.

All injections on the buccal and labial sides should be made at the point where the cheek or lip blends with the gum, with the open or beveled side of the needle toward the foramen or apex of the root.

Never inject into or near an abscessed condition. Use Nitrous Oxid in preference. I have had a few cases of soreness in the tissues where the needle was inserted which I traced to the use of commercially distilled water. It should be fresh, and I believe it advisable for every man to distill his own supply.

The anastomoses of the ends of the right and left inferior-alveolar nerves must always be taken into consideration, while operating on the mandible anterior to the first bicuspid. Why it takes a deeper and more profound anesthesia to extirpate a pulp than to extract the tooth, I am unable to state, but it is a fact.

The results are wonderful and mighty pleasing and it will serve a larger percentage of cases in general practice than will nitrous oxid and oxygen, but neither one alone is sufficient. If you want to handle one hundred per cent. of your cases in the best possible manner, you should have, besides your conductive outfit, a modern Nitrous Oxid and Oxygen machine.



CHICAGO DENTAL SOCIETY.

A regular meeting was held March 19, 1918, with the President, DR. P. B. D. IDLER, in the Chair.

Dr. Edmund Noyes read a paper entitled "Silicate Filling Material."

Dr. G. A. Thompson followed with a paper entitled "Technic of Root Preparation and Porcelain Jacket Crown Construction."

DISCUSSION.

DR. W. V. B. AMES:

When we see the name of Dr. Edmund Noyes on a program there is the assurance that the subject will be treated conservatively. In this instance his opening sentence is, "The time appears to have arrived when it can be affirmed that silicate fillings have acquired a positive and useful and probably a permanent place in dental practice."

We have been accustomed to expect from as careful a man as Dr. Noyes, a paper made up largely of advised precautions. Only a few years ago the average instructions given out by makers and essayists were so hedged with cautions that, as a sample of the attitude of the profession, a member of our State Society was led to ask me as to my Berylite, "Can the operator have an evil thought without influencing the behavior of the cement?"

With correction of tendency to discolor and mastery of setting to cure pulp destruction, these cements of necessity became popular. There has, however, been a statement to this effect, "Had it happened that zinc oxid itself was translucent, there would have been no need for the silicate."

Silicious cements could not have become really useful as well as popular had there not been the inherent possibility of greater integrity of mass when subjected to stress, abrasion and solvents, as compared to oxyphosphate of zinc.

Translucency alone could not have justified the popularity of the material. Translucency with greater integrity of mass does justify their extensive use.

Clinical experience has taught that oxyphosphate of zinc is less dependable upon proximal than upon occlusal surfaces. This fact easily indicates that the zinc cement has greater physical than chemical stamina. The chance of subjection to the products of fermenta-

tion and putrefaction in interdental spaces is great, while upon occlusal surfaces it is reduced to the minimum and therefore there is the clinical fact.

The agglutinating phosphate formed in a mix of oxyphosphate of zinc which binds the remaining oxid particles into a mass, is liquified by those by-products, whereas the binder produced during the mix and setting of a proper silicious cement is proof against these destructive agents.

Given translucency, and integrity of mass, there is one other factor which goes a long way in justifying the use of these cements. This is the fact that the best texture, i. e. integrity of mass, may come from a consistency which will permit of almost any operation, from the making of a filling to the setting of a porcelain jacket crown. In other words, the consistency of mix which will enable the setting of such a crown is very little removed from that from which best results would be expected in the making of a filling.

For arriving at a proper proportion of powder and liquid in mixing these cements, I want to suggest the trying out by weight of one grain of powder to each drop of liquid as dropped from the sort of small pipette furnished with several of these cements. By such a trial it will be found that $\frac{7}{8}$ as much powder is required in a mix which is yet thoroughly plastic as is one which is slightly gummy. A slightly gummy mix is as stiff as need be for maximum integrity of mass, and the difference between this and the result of the mix sufficiently plastic for setting an inlay cannot be easily distinguished.

I heartily commend Dr. Noyes' telling you to recognize that the initial hardening is analogous to the setting of oxyphosphate of zinc cement. Recognizing the silicious cements as oxyphosphates with which chemical behavior may be regulated to suit the requirements of the case, enables the operator to become master of the situation.

Just in proportion as silicious cements are looked upon as differing radically from other oxyphosphates in the chemistry of the setting process, will the manipulation present difficulties. By considering these cements as *silicious oxyphosphates* we get close to an understanding.

These cements *are* oxyphosphates of calcium and should be thought of as being so compounded that cement making phenomena come from action of phosphoric acid on calcium oxid, the action

being retarded by the intimate blend *by fusion* with alumina and silica. The alumina and silica act as diluents and give integrity to the resulting mass.

The ingredients of the powders are very similar to a calcium feldspar. Feldspar furnishes the chief ingredients of porcelain and these cements might reasonably be considered a porcelain in which there is *chemical* agglutination, instead of by heat.

The term "silicious cement" appeals to some for descriptive purposes, rather than "silicate." Normal silicates do not afford cement making properties. Silicious mixtures may.

Knowledge of some of the chemical reactions taking place should assure one of constant behavior. Variability of behavior has been the stumbling block, and this has been induced to a large extent by direct and indirect claims of manufacturers that the so-called silicates needed to be considered as differing radically from oxyphosphates of zinc.

The manufacturers of translucent and other cements have been much berated by essayists at times for refraining from disclosing the formulae and methods of manufacture as an aid to the dentist in the use of the material. On requests for such information, I have furnished the following:

"Ames' Berylite liquid is a modified phosphoric acid solution, and the powder is composed of basic silicates of calcium and aluminium, aluminates and rare earths combined at so high a heat that an indescribably complex compound results." Much camouflage, including patent specifications, has been offered which has not come as near the facts as my simple statements. Today it is pleasing to have Dr. Noyes present this subject, recognizing the material as oxyphosphate and without this sort of a grievance against the manufacturers.

Recognizing these materials as oxyphosphates, we have a tangible beginning toward understanding the primary setting process. More than twenty years ago I attempted to make plain the setting of oxyphosphates by assuming that they were masses in which oxid granules were held together by a basic phosphate. In the case of the silicious cements, or so-called silicates, the part corresponding to the zinc oxid of an oxyphosphate of zinc happens to be a powdered glass, which, as we have said, has been produced from fusing calcium oxid, silica, and alumina or closely allied compounds along

with modifying ingredients at so high a heat that "an indescribably complex compound results."

No one risks his reputation in attempting to accurately describe the nature of such compounds, any more than writers on glass and glass manufacture attempt to definitely give the chemistry of any sort of glass, much less to venture a positive opinion on one requiring in its fusion the very high temperature needed for the fusion to a glass of the ingredients used for Berylite, for instance, in the proportion in which they are blended. (Samples of glass passed.)

For dental cement purposes this must be a basic glass instead of a true silicate and it is for this reason that I prefer the term "silicious cement" instead of "silicate cement." Basic silicates are possible cement ingredients, normal silicates are not. The basicity of such a glass enables the acid to attack it with the result of producing a cement.

The fineness of division of such a ground glass will affect the setting as well as the translucency. From fine grinding more surface of the basic glass is presented for action and quicker setting will result. In proportion to the fineness of grinding there is greater refraction of light and reduction of translucency. A happy medium is therefore possible in the grinding for both setting and translucency. An extra fine powder adapted to setting of inlays and porcelain jacket crowns will not give satisfactory translucency *in mass*, but is entirely satisfactory as a thin film.

After recognizing the mass resulting from treating such a glass by an acid phosphate solution, as an oxyphosphate, we can, with profit, theorize as to the nature of the material which forms during the mix and which agglutinates the undissolved particles of the basic glass to give a cement. Dr. Vogt before a section of the National Association, 1917, in accounting for the initial hardening of the cement, says that the soluble acid phosphates formed during the first part of the mix are converted into very insoluble normal phosphate, combine with water and crystallize out in so dense a mass of minute interlocked crystals that the individual crystals cannot be detected even by a high power microscope. He later attributes the secondary hardening partly to "desiccation of colloids."

Without attempting a lucid explanation of colloidal structure and efficiency, I have, during more than twenty years, spoken of the binding together of the basic undissolved particles in cement as

"agglutination." Glue is colloidal. A colloid is a glue or jelly-like substance. Chemically it is specifically uncrystalline. In subjecting the powdered basic glass to an acid phosphate solution, the phosphate formed from the action of acid upon base, passes, I believe, from the acid to the normal and on to a more basic and solid form, from being supersaturated by the base with which it is in contact.

Particles are thus bound together and the colloidal or glutinous phosphate which is *also* in contact with a surface of dentin or enamel, literally knits to the inequalities, i. e. the orifices of the tubuli and any irregularities of the enamel surface and probably becomes basic to the extent of becoming a solid, *partly* by the acid becoming satisfied at the expense of tooth substance. Adhesion may be expected from this knitting to inequalities of dentin and enamel by such a glutinous substance. I derive more satisfaction from considering that this colloidal phosphate becomes a solid by supersaturation, rather than by desiccation, especially since desiccation is the thing to be avoided in the proper setting of these cements.

This is to me a more plausible explanation than that *normal* phosphate crystallizes out as crystals so minute as to be indistinguishable under the most powerful microscope, but as far as enabling an appreciation of and control of setting, it is tweedeldum and tweedelde, whether the agglutinating substance is normal or basic phosphate.

Thinking of the phosphate as becoming basic at the expense of the basic glass helps me to a satisfactory explanation of the primary setting of cement and does not hamper my appreciation of the secondary setting.

Dr. Vogt in the paper before mentioned, laid special stress on extensive spatulation and cited that a hardened pellet can be crushed to a powder which will react with more of the cement liquid. This proves mostly that the binder is such that original particles are fractured in the grinding of the pellet, if it is conceded that any mass of cement consists of particles of powder held together by the phosphate formed during the mix. It is a case of the glue being stronger than the object glued. In the discussion of Dr. Vogt's paper I felt called on to caution against unlimited spatulation with *all* cements, as with some varieties enough *normal* phosphate may be produced to kill setting. Dr. Noyes advises extensive spatulation. I need to say that an amount of spatulation which would be needed

with Certified Enamel would be ill-advised with Berylite, this because of a much heavier liquid being furnished with Berylite, i. e., it contains more phosphatic modifier and less water. Such cements should be spatulated to produce a homeogenous mass, but over spatulation is easily possible.

I have never considered arsenic to be the devitalizing agent in silicious cements, but have ventured the opinion that free phosphoric acid should be held responsible. It is largely with the object in view of getting rid of free phosphoric acid and causing nearly complete setting in a comparatively short time that I have so strongly advocated the application of heat.

Dr. Weston A. Price in 1914 ventured the opinion as a result of tests, that any temperature up to 175° F. was permissible, shortening the time of setting, making a harder and stronger mass under crushing tests after 24 hours and in every particular seeming to make as good or a better filling. I am inclined to say that 125° F. is a sufficiently high temperature for the purpose and is as high as can be conveniently imparted to a vital human tooth. There is no question in my mind but that with a cement in which the liquid has not too large a water content, acceleration of setting by heat is advantageous.

As to the proper time of finishing, there is no doubt of the advantage of waiting the 24 hours or more, as the texture is better by that time for taking a finish. As to the need of being kept dry, if caused to set promptly, I do not believe there is any real need of the mass being kept even partially protected. Complete dryness is not accomplished and if it could be, it would be objectionable. If the filling is left slightly overfull there is then material for the finish.

If it happens that a cement is peculiar in that it presents a better appearance some hours after its insertion than when primary setting only has taken place, a covering of paraffin or varnish is useful in providing for a better first impression to the patient than if inspected soon after insertion.

DR. W. T. REEVES:

First, I want to compliment Dr. Thompson on the very thorough and excellent manner in which he has handled the subject of porcelain shell crowns. I think his paper, without any doubt, is the most complete that I have ever had the pleasure of hearing or reading.

I suppose I was selected to open the discussion on his paper

because I was known to take almost exactly the opposite point of view as to the method and manner of constructing porcelain shell crowns. I want to say this, however, I would not be doing either justice to Dr. Thompson or to myself in trying to give an offhand discussion. Dr. Thompson told me that he was unable to finish his paper until this morning. I did not get it until noon, and as I was so busy in the afternoon I was only able to read the paper through once and make a few notes. While Dr. Ames was talking I made a few notes on points I would like to speak about briefly.

I do not believe it is a privilege in opening a discussion on a paper to present an entirely new paper on the subject. I think one's discussion should be confined to the paper itself, and I shall try in what little I have to say to confine my remarks to discussing the points brought forth in Dr. Thompson's paper.

I agree with the essayist in that I do not see any reason for the use of analgesia or any anesthetic for the patient to enable the operator to prepare a tooth to receive a shell crown and do it without any discomfort to the patient.

The method he has given in regard to the employment of warm water is new to me. It would seem to me theoretically wrong. Pain is produced by heat which is produced by friction. That is what produces pain in all teeth we operate on. It would seem to me that the employment of hot water would be in the direction of increasing the heat friction. I employ cold water and stones in the preparation of teeth and succeed without any discomfort to the patient merely by handling the case with a reasonable degree of slowness of operation.

He speaks in regard to employing anything as an anesthetic for students in college and likens the average dentist in taking up the work to a novice as a student would be. I do not think any dentist has any business to take up work at the chair until he has done dummy work, when he is no longer a novice in handling teeth and knowing what he wants to do in preparing tooth stumps and succeeding in the work he is following. It is his duty to make himself familiar with the work and no longer be considered a novice as far as his work is concerned.

Dr. Thompson says that the removal of the enamel and the preparation of the stump for a shell crown is so easy that it is a joke, and that the enamel can be removed in ten minutes. So far as my experience goes, I do not believe there is any one who can

remove the enamel of a tooth in ten minutes. It is up to all of you to adopt whatever method you like, using either hot or cold water to produce results and do the work with comfort to your patients.

In regard to the further completion of the stump, in the removal of all the enamel under the free margin of the gum I take decided exception to that procedure. I believe that the shoulder should be established in the enamel, but that it should be just under the free margin of the gum so that the gum hides the joint. It gives you a much harder surface for your shoulder to which you can burnish, and I believe all this work should be done in the mouth, and I burnish the matrix in the mouth and burnish it upon the shoulder of enamel that is established there. It also gives you proper contour for reproducing nature's own form as in the illustrations that were thrown on the screen. The essayist showed us crowns wherein the shoulder was not produced as nature had intended and the poor results that were obtained in reproducing porcelain to imitate the enamel as it should be under the free margin of the gum. If the shoulder is short in the enamel you will have that already established to give you the lines of reproducing the natural teeth.

In connection with another feature of reproducing the shoulder, the essayist said that shoulders should be cut inwards and upwards. That means a slant towards the tooth.

In the illustrations he also brings out the point in connection with bicuspid and molars of shaping the stump to reproduce underneath the shoulder the form of the tooth so that the porcelain shell shall be no thicker over the cusp than it is in the grooves or embrasures of the tooth, thereby making stronger resistance to the force or stress of mastication. I think he is in error in that respect. In these three features he produces there he precludes the possibility of getting the completed shell home to the place in which it is fitted. All strength comes in the shell of the porcelain in the absolute fit and adaptation of the shoulder to the cone or root portion as you have prepared it and the minimum of cement that solidifies and makes it one whole. That is where you get the strength. The form of shoulder and cusp extending up under the crown are such that when you force that down you cannot force out the cement, and thereby get a minimum of cement; whereas if you had begun your shoulder in the opposite direction, forcing the shell on, which is cone-shaped, the cement would exude from under the partition, so

you would get the crown down to its place and secure close adaptation of cement and get strength.

I will now pass on to the consideration of shade and color. In his paper Dr. Thompson gives a formula for mixing white with other colors in order to produce a large number of colors, some fifty I think he has in his paper whereby he can match all the gingival portions of crowns accurately, and then farther along he mentions the new body of Justi and the method of using that body, which is directly the opposite, as I understand the paper, to the interpretation of it and of what he has given us in the first part. I do not think that there is any need of dentists studying colors and analyzing them theoretically and thereby becoming experts in the handling of colors, etc. I think that what the dentist ought to bear in mind is the method of the artist in thinking about paints and mixing them to produce different colors. He takes them as they are and produces results he wants by the means and methods of applying them. I think we should all use colors by knowing how much of a color will produce a result. To illustrate, you can take any body that is produced and take the shade guide that is furnished with it and produce that color, provided you pick the same bulk as the shade guide. For instance, if we bake porcelain as thick as my finger you would then get that definite color. If you bake a piece of porcelain that is only half as thick as my finger, you will have a lighter shade of that color. You have to bake the same bulk of any body to get the same shade as the color guide that is furnished with the porcelain that you buy. I believe that the way for any one to learn how to match colors is to learn where these colors are, and place the amount in bulk that is needed to produce the shade you want. If that is going to be overlaid with any color, calculate that in that manner, and when your color overlies the deeper shade it will give you the shade as found in the natural tooth. Any dentist can learn a great deal by studying the teeth and looking for colors. As he gains experience and knowledge he will see much more in the way of colors in teeth. He can use those colors in this way: for instance if he has got what we term a typical light yellow tooth, he will find his yellow is deeper at the gingiva; at the center of the tooth he has another color, and at the cutting edge still another. In most teeth there is a blue tinge at the cutting edge, but the average dentist will never discover it unless he takes blue porcelain and holds it to the tooth, not that there will

be anything like the color of blue, but if there is any blue in that tooth there will be harmony between the blue and the tooth. If he is in doubt in the matter, let him take a piece of gray color of his shade guide and hold it to some tooth and he will find immediately the contrast. He wants a little blue that is there to produce his result. He wants it at the place it belongs in the tooth, and he can put it there by using the proper amount of blue body that he has to produce that shade of blue. If he will bake by using certain layers, instead of trying to mix blue with the yellow to get the shade, he will have more difficulty in the results he gets by putting blue and overlying that color which goes to the cutting edge.

There are other points I have jotted down to discuss in connection with Dr. Thompson's paper, but the lateness of the hour precludes further discussion at this time.

DR. A. E. SCHNEIDER:

There are a number of emotions within me after listening to Dr. Thompson's paper and its discussion.

First I want to congratulate him on the excellence of his paper, but I do not like to see him go into so many of his experimental details, for the men who are working along this line on a practical basis are trying to simplify the technic so that the general practitioner may take it up in a simple way and not be stupefied by the amount of detail, experimental I am sure, that the Doctor has presented to you tonight. The practical technic of today is comparatively a simple procedure.

The next point I wish to speak of is in reference to the temporary teeth that he places back in the mouth after the tooth is prepared and before the patient is dismissed.

This can be used for two purposes and credit so far as I am able to judge goes to Dr. A. L. LeGro of Detroit. If you will run up the individual tooth impression in cement and around this cement replica of the prepared tooth, fold a light tin foil and cover this with a mix of cement, to the former tooth contour, you can use that tooth as a temporary tooth and a duplicate of it will allow of a more accurate bite by taking the bite with the cement tooth in position on the tooth when the bite is taken. The bite can then be taken in modelling compound without running a chance of displacement when the cement root is placed in the bite. The temporary crown can be set with Evans Gutta-Percha.

I have not been able to determine why it is necessary to run a furnace up two buttons at a time, in the heating.

The first button will carry the heat to 1800° F. or thereabout. My method is to determine the button that will carry the porcelain to a biscuit or fuse anywhere from 8 to 12 minutes and thereafter run the lever from the first button to that position in one move. I find that the oven will last just as long as it will when you move the lever over one or two buttons at a time.

You will also note that the biscuit bake runs 100° under the full fusing point.

The plane of the shoulder, that goes into the technic of tooth preparation is a study in itself, and I think based on definite mechanical principles or laws.

It should be a plane cut into the tooth at right angles to the applied incising or attritional force applied to that tooth, in mastication.

You will get a truly mechanical preparation to your tooth if you will follow the natural contour of the dentin under the enamel because in her mechanics nature can not be improved upon.

If you will follow out the contour on the occlusal surface reproducing the marginal ridges, which are the strength factors in the tooth's formation in both the enamel and the dentin, you will achieve a better result, because when the marginal ridges give way the tooth is weakened perceptibly for the "Keystone of the Arch" of the tooth's natural strength is gone.

By placing a tooth in a flame and breaking off the enamel you will readily grasp my idea of how the dentin should be prepared occlusally on all posterior teeth to which is added the shoulder at the gingival.

As to the cementation of the finished veneer, Dr. Thompson says that he presses the crown home with considerable force. I feel that should be regulated by the flowing properties of the cement that you use. Just enough pressure to create a flow and as long as the cement is of a certain consistency you can press the tooth veneer home and it will go only so far and so quick as the physical properties of the cement will allow unless you wish to take the chance of fracturing your porcelain. You can get a satisfactory contact of porcelain to the tooth if the pressure brought to bear is only enough to cause the cement to flow until the crown is in its seat, then hold

it there to overcome the tendency of all soft materials to "ball," until it is hard.

As to close adaptation spoken of by Dr. Reeves, there is no possible way of getting it a bit closer by Dr. Reeves' method than by Dr. Thompson's, for the simple reason that you cannot get any closer than the cement will allow. It will be the same in all cases where the materials used to build your porcelain upon, and to set your porcelain with, are the same. This strength feature depends upon the character of the cementing medium.

Lastly, I believe this to be the first porcelain paper read before the Chicago Dental Society in the last ten years.

Also, just ten years ago now and in this building I gave the first clinical demonstration of the technic and methods delineated here tonight by Dr. Thompson, before this society in a table clinic, so you can perhaps appreciate the various emotions, in retrospect, that I have gone through tonight.

DR. NOYES (closing the discussion on his paper) :

I feel great satisfaction in having had my paper discussed by an authority and expert, and I am very glad that two or three of the authorities I quoted have been called into question and corrected.

I was especially glad to hear Dr. Ames say that spatulation beyond the point of thorough and homogenous incorporation of the powder and liquid is not necessary though contrary instructions have been sent out with one of the silicate cements. It is desirable to put a larger portion of powder into the liquid at first rather than to begin with small portions and increase. The first portion of powder put into the liquid should be as much as can be immediately and quickly incorporated with it and successive portions smaller.

The question of accelerating the setting by heat I was glad to have elucidated beyond what I had done.

DR. THOMPSON (closing the discussion) :

One of the points I want to speak of in connection with Dr. Reeves' remarks is in reference to the position he recommends the cutting of the shoulder in the enamel. He fails to take into consideration the knowledge we have of the histology of the enamel. The enamel-rod direction in this position will not permit us to leave any enamel and have a properly prepared shoulder. The shoulder should be square at right angles to the long axis of the tooth or it should incline inward and upward toward the apex; we cannot make

either one of these preparations in the enamel without leaving short enamel-rods, which will fray out when we take the impression or later under stress.

He said, "The enamel cannot be removed from a tooth in ten minutes." If a tooth needs a crown, all of the enamel is not present. If you remember I said the average tooth where I used this type of crown had large fillings on the mesial and distal which had failed, if you break away the angles which is a simple matter the proximal surfaces are denuded; this leaves a small amount of enamel on the labial and lingual. Follow the technic I have outlined and most any of you can remove it in ten minutes.

I spoke of orange porcelain and mentioned its advantages, later I advised the use of the Justi porcelain. Dr. Reeves criticized me on these points as being inconsistent. Instead of being inconsistent it is the reverse, as I know the basal colors of the Justi porcelain is orange and is the primary principle which gives us the beautiful results we get with it.

He spoke of a blue tinge we see on laterals and said you can reproduce it by using blue porcelain. This elusive color we frequently find in that position and describe as blue is opalescent gray. If you wish to reproduce it accurately never use a blue but work with your grays and take into consideration the action of light as a tooth of this character is always thin labio-lingualy.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held March 6, 1918, with Dr. J. E. Hin-kins in the Chair.

Dr. Arthur E. Smith read a paper entitled "Anesthesia in Dentistry."

DISCUSSION.

DR. C. N. JOHNSON:

I want, as a member of the Odontological Society of Chicago, to tender my sincere thanks to Dr. Smith for coming here tonight and presenting this paper. It is a compliment to the Society to listen to the presentation of a paper of this kind. I am not in a position to discuss the technic of local or general anesthesia, but I should like to refer to several points that have been made by the essayist.

In the first place, I was deeply impressed with his tribute to the old teachers who taught us as boys on the benches. I never hear references made to these old men that I do not feel like taking off my hat. As the essayist said, these men gave us the best thoughts they had from their point of view, and I want to pay this tribute to them, that many of the things they taught us in those days are fundamental yet. We have advanced in some particulars, but as I look back on those early days and on the names of many of the men who are gone, I revere their memory, and I was much gratified that the essayist mentioned them in the manner that he did.

Another thing he referred to that has been very vividly in my mind, particularly in recent years, is the fact that some of the methods employed in dentistry have been foisted on us in a most unfortunate way by the manufacturers for the purpose of selling certain apparatus. Dr. Smith told the exact truth about them. Some of these ideas have been devoid of scientific value, and yet men in the profession have been led to follow them through the enthusiastic advocacy of the salesman. That has been a very unfortunate thing, and I believe that the conscientious men in the dental manufacturing business will acknowledge that it has been a mistake. We have all in our minds instances of that kind, and I was very glad indeed to hear the essayist, knowing the position he occupies before the profession, give expression to that particular thing.

I want to express my great gratification to the essayist not only for coming here tonight, but to pay him the compliment of saying that any man who goes into a subject as carefully and as thoroughly and as conscientiously as he has into this one, will do a great deal of good in the profession. If we had men in all of the branches of our profession who would take their particular field of work and go into it in the same painstaking way that Dr. Smith has into this subject, it would tend to the broadening of the profession, and to the education of the entire body that constitutes dentistry today. In general practice I have not the same need for some of these methods that specialists have, at the same time I see their value.

DR. TRUMAN W. BROPHY:

I am sure, Dr. Johnson has expressed the views of us all when he says that we are glad to have heard Dr. Smith present this paper on such an important and interesting subject.

It has been quite a long time since the subject of local anes-

thetics has claimed our attention, and it was quite a while before I became sufficiently interested in it to make use of Dr. Smith in the way he has described. While I have used these methods of anesthesia in blocking and anesthetizing areas upon which I have operated, I still feel that I have a great deal to learn in this direction, and I sometimes feel I am very weak when I come to do this work because I do not get results some others may obtain in doing the same kind of work. What Dr. Smith has done in this field only confirms the views which I think we all hold, namely, that if one has an aim in life and will cling to a subject and work to that end, he will succeed. It is a matter of great importance I think to impress upon the young men of the profession the thought that something that appeals to them more keenly than any other should claim their attention, and then working constantly and persistently with a desire to succeed, they will be successful and their lives will not be a failure. That has been the case with Dr. Smith. He looked over the great domain of dentistry, and in all its different departments he has observed there was something to be done in this field; that there was something many others were not attempting to do, and so he directed his attention to this particular work, and we all know what he has accomplished.

With reference to a remark I made to him sometime ago as to the advisability of taking a medical course, I made that remark because I felt he would be greatly benefitted by so doing. I have tried to recall the incident, and I think I have, but advising young men is nothing more than we all do. We advise young men as to what we believe should be the best for them to do.

I think local anesthesia should be better understood. I think that nearly every practicing dentist can use it to great advantage when he thoroughly understands it. He can use it with advantage to himself and more particularly with comfort to his patients.

There is so much to be said about those who are in close touch with the work of Dr. Smith, that I feel I have nothing more to say except to express my appreciation of what he has done, and it will be gratifying to me if he can find time to come to the hospital some time and, when I have suitable cases, demonstrate to the students the benefits of this work. I have been so much devoted to general anesthesia that I have used it almost to the exclusion of everything else, but after all, I am satisfied I should use local anesthetics more.

DR. J. G. REID:

I think this is about the second time I have heard the essayist speak on this subject, and I think many of you became very deeply impressed with the demonstration he made before our state society at Quincy. I consider this a particularly opportune time for the reason that we are not overcrowded, and naturally we get the evolution of anesthesia and anesthetics, and a more comprehensive idea of the work that Dr. Smith has done and is doing. In all probability, as time progresses and a man becomes interested in a thing of this kind in the manner he is, he soon realizes, like all investigators, he is just being led on from day to day, and he gradually maps out what will be the eventual result; but I can imagine that the future possibilities of his work may be of greater value than he has already anticipated.

One great difficulty I see in the mastering of local anesthesia in the general practice of dentistry is that it is too broad for the general practitioner to take up unless he makes a specialty of it. To do this work, it requires, as I see it, a number of years to become expert in this practical everyday application to the general practitioner, and unless one becomes thoroughly infatuated with this sort of thing, he never gets the results he ought to have because of the fact he has never gone into the matter as the essayist has done. The general practitioner does not seem to have time for doing this sort of thing, and unless he has time he will make a miserable failure of it. The result is that this practice of anesthesia is condemned unfortunately by a great many men when it ought not to be. It receives a certain amount of censure, and I have never—I am sorry to say this—attended but one clinic wherein I saw the actual operation of nerve blocking, and an operation performed under this kind of local anesthesia. Dr. Potts at our State Society operated on a woman for the removal of a tumor. The operation was unquestionably a success, so far as the patient experiencing any pain was concerned. Fortunately, she was a good patient to operate on. She was in accord with the operation and gave herself up to the surgeon just as comfortably and as peacefully as one would desire. The result, therefore, was that the operation was entirely successful. It only demonstrates to me the fact, and the essayist has clearly pointed this out in his paper, that you must have the cooperation of the patient in these operations to get the full and beneficent result.

Of course, if a patient has lost consciousness under general anesthesia, that patient has nothing to say, but when it comes to local anesthesia, I can see wherein there is a good deal of apprehension on the part of the patient. I am speaking particularly now of major operations performed under local anesthesia. I do not believe this would be true in operations where we are called upon to extract a tooth or two or to remove pus, but in operations of a major character it is a different proposition.

I am greatly pleased to have heard this paper; I have been really entertained, and I have learned something. Occasionally I gathered up a point here and there as the essayist was reading, and his paper has done me much good. I wish to thank him for it.

DR. W. V.-B. AMES:

I would like to ask Dr. Smith to what extent idiosyncrasies of patients can be recognized in planning the administration of toxic agents by the injections described? Is it easily possible by inquiry, or otherwise, to establish proper dosage? Does dosage need to be considered in this sort of administration of a drug as the internal medicine man needs to adapt dosage to peculiar susceptibilities of patients? If there are any methods by which these idiosyncrasies may be recognized, I would like to have Dr. Smith acquaint us with them.

DR. P. J. KESTER:

This subject has fascinated me. I am intensely interested in any subject when it is carried out scientifically and treated logically and conclusively. In other words, the work Dr. Smith has done, as described in his paper, is one of the most wonderful exhibitions of this particular subject I have had the pleasure of hearing.

As to its application, so far as I am personally concerned, it is practically valueless, but as a scientific requirement, it is worth as much to me as to any of the gentlemen present. As to its applicability in a general sense I have very grave doubts. I doubt very much, if you called the dentists of this city together and had them listen to this paper, if any very large percentage of them would acquire the necessary knowledge to apply these methods of anesthesia that have been described. I refer now particularly to nerve blocking.

As I look at these specimens, which are the most interesting I have ever seen, it brings to my mind the whole mental outfit, the

nervous outfit, of man. When we listen to the results that have been obtained from these methods of local anesthesia we are amazed, and some of them really seem impossible to me. I presume I am gradually losing my dental nerve.

DR. SIDNEY J. KNOWLES:

I was very much prejudiced against novocain nerve blocking until last December. At that time I spent four days and evenings studying with Dr. Smith, and since then I have been equipping myself and devoting time and energy in trying to learn something more about dental anatomy. There have been a number of things which have stimulated me to take up this work. I saw Dr. Fisher demonstrate the use of novocain, and was not particularly impressed with the demonstration. Some of the men who saw this demonstration made the same statements with regard to using it that I have. At the time I saw Dr. Fisher's Clinic at the Frances Willard Hospital, he operated on seven or eight patients, and every patient was given validol, as each showed some signs of collapse. I was laboring under that feeling of prejudice when I saw that a reasonable amount of injection of the solution into the system produced such an effect. I have equipped myself with a complete outfit, and intend to go into this work and make a thorough study. I feel there is much to learn and to know about it, and there is so much to get out of it. I do not know how much application I will make of it, but I am going to go at it in the scientific way in which Dr. Smith has presented it. There is no doubt about the value of local anesthesia in dentistry used in a definite scientific way. I believe the cases of collapse in Dr. Fisher's clinic were due to the strong solutions and to the overamount of suprarenin which he employed, because I have seen Dr. Smith inject seven or eight patients as compared to Dr. Fisher's, and I could not see the slightest physical change except in one of the cases. In one case he had collapse that was apparently due to a psychic action and not novocain.

Dr. Kester refers to the problem as being a difficult one. It is certainly a big one. Dr. Smith tonight has shown us that the hardest injection he makes is when he injects the second branch. One must be very familiar with the anatomy in order to make these injections properly and accurately.

I want to touch one or two other points, one of which is

asepsis, which is such an important factor. When I hear of gangrene and necrotic conditions taking place, sore jaws and sore muscles, I am inclined to think in those cases the trouble is largely due to a defective technic and knowledge of anatomy in injecting the solutions into the muscles and not knowing how to mix the solution. If the water is properly distilled, and autoclaved and definite isotonic solutions made and novocain used without too large an amount of suprarenin, and an intelligent injection of the minimum amount of solution is made, it is possible to safely handle novocain and get some wonderful results. This work presented tonight is not only for the oral surgeon, but it is for the daily practice of dentistry. I have made quite a number of injections in the most careful and conservative way, and I expect by increased experience I shall be able to do still better work. In order to do good work in nerve blocking one must thoroughly understand the anatomy of the parts, and as Dr. Smith says, place a minimum amount of the solution where he wants it, it is possible to get definite anesthesia in most places. There are one or two exceptions.

The selection of cases is largely a question of personal equation, namely, patients who cannot properly react against novocain. I believe that is minimized by the fact that novocain, we are told by scientific men, is so much less toxic than cocain, and if carefully prepared and carefully used the danger is greatly minimized.

I want to thank Dr. Smith for presenting this paper. He has stimulated me and encouraged me to go on with my studies in this work, and I am sure that I will be better informed in regard to how to use local anesthesia in the future than I have been in the past. I am convinced that there is wonderful merit to it, and it is the painstaking and conscientious men who are doing this kind of work like Dr. Smith that are going to make it live. All of us remember how the late Dr. George Cook used to talk about the Bacteriological question and its importance in causing pathological conditions. It is one of the biggest questions we have today. Dr. Cook was a man much in advance of his time. And so it is with local anesthesia, it is going to have its definite place in the practice of dentistry, and dentists are going to learn that they must not inject novocain into the tissues promiscuously. It is very essential for one to know how to block certain definite nerve trunks in order to accomplish what is

desired. Each of these injections have been worked out scientifically, so that they can be made without guesswork.

DR. L. L. DAVIS:

I have very little to say in regard to this paper and to the remarks made by Dr. Knowles. However, the thing that impressed me most forcibly, when I got to thinking over the work Dr. Smith has presented to our little coterie, was the absolute lack of knowledge of anatomy on my part. If this subject had been presented some 25 or 35 years ago I would probably have known quite a little more about the anatomy involved in making these injections, but not having thought anything about it, I am in the position of most of you, namely, that we are here to learn and to get a good clear anatomical picture of the muscles or nerves or portion of the head and face in which these injections are made. The time spent in studying dental anatomy is well taken up, and if it were only possible to emphasize the necessity for that kind of study on the part of dental students, I think this work would play a large part in making the students study a little more in regional anatomy. There is no reason why every dental student should not be taught this work that Dr. Smith has outlined so clearly. While I have never given it much thought except within the last year or so, after what I have heard Dr. Smith say in regard to the subject, it is without doubt the thing that is going to make dentistry beneficent to the patient. It is a simple matter when you clearly understand it. Some of these nerve blockings are so simple, that they occupy very little time, and with a fair amount of knowledge of anatomy it is very easy for the operator to make the injections. He can prepare cavities and treat pyorrhea without inflicting pain. He can do things which under ordinary circumstances he would hesitate to do because you know, in spite of swabbing the parts with cocain, a certain amount of pain is produced. With this method you can absolutely prevent pain and discomfort to the patient. So I think it is the thing in the future for the practicing dentist to know what to do and how to do it. The only thing that is necessary is a more thorough knowledge of the regional anatomy of the head and face on part of the dental student.

When it was suggested that we get an essayist from the outside, Dr. Knowles and I talked the matter over, and we thought an evening could be well spent by this little gathering listening to a close

talk by Dr. Smith on this subject, not that we older men can apply it to a very great extent.

I have already insisted that we have got to review our anatomy; that it means months of study to get ourselves in shape. It is something to which we have to devote considerable time and attention in order to guard against the puncturing of muscles and blood vessels far remote from the point that should be injected. A good deal of harm can come from the indiscriminate use of the needle in bringing about local anesthesia. I can very well see how these methods of producing anesthesia in the hands of men who are well versed in anatomy will bring about excellent results. However, this work requires special attention in order to do thorough and effective work.

DR. F. E. ROACH :

It is a bad policy for a man to occupy the time of other men in talking about a subject he does not know anything about; therefore, I hesitate to say anything on the subject Dr. Smith has presented to us, because I am free to admit I know very little about it. That does not mean I am not interested, because I am interested in this work. I have enjoyed Dr. Smith's presentation tonight as I have many times before. I have seen Dr. Smith's Clinic and have heard his papers and his talks several times in various parts of the country, and have always been interested in his work, not that I have any idea whatever of making use of any of these methods of inducing local anesthesia. The first time I saw Dr. Smith give a clinic I had no thought in my mind of making any use of these methods, and yet I stopped for a minute to see what he was doing. He always had a crowd, and his work was so interesting that it was hard to get away. I saw at once that he was a master of what he was doing, and it gave me very great pleasure and interest to stay and watch him give his clinic and listen to his talk for I felt that he knew what he was talking about.

I cannot somehow come to believe that this is a thing for promiscuous application. I believe a man must be especially trained to do this work, and I think this a field in which Dr. Smith may do a great service. He is teaching others how to do this work as it should be done, thereby making it of value to a greater number and training these men so that they will do it as it should be done. It goes without saying that a man must have a better knowledge of his

anatomy and his technic must be right; his instrumentation and knowledge of procedure must be thoroughly understood. This is work which I think Dr. Smith is especially qualified to do. Where a man is so situated that he needs this general anesthetizing of the parts of the mouth, there can be no question about the value of it. I can speak not only from having seen a number of operations that were eminently successful under local anesthesia, but I can also speak from personal experience.

I want to join the other members in thanking Dr. Smith for giving his time to this subject. I know we will all be benefitted indirectly, yet I feel that this is something really for the specialist. I have been surprised that more men in the dental profession have not made a specialty of this line of work after seeing the advantages of it and the positive results. All of us have many cases come to our offices where we need something of this kind, and yet I really do not feel that it is an operation that very many of us can do as it should be done and, it seems to me, if we had some one who made a specialty of it, so that we could send patients to him for these injections, and then let them come back to us for operation, it would be a Godsend. It strikes me that would be a feasible thing, and in that way we would get the best possible results.

DR. J. E. HINKINS:

I enjoyed Dr. Smith's paper very much. The accuracy with which he makes these injections has been a revelation to me. I have seen his clinics, have watched his work very carefully, and have attended many of his lectures. I attended Dr. Fisher's Clinic and have tried once or twice to make these injections but have not succeeded very well in doing so, I have never cared for the gas outfit, and the analgesia produced from the administration of the gas in some cases has not been complimentary to the dentist who was using it.

As to nerve blocking, I thought it would be the thing I wanted, but after making two or three failures I soon realized that my knowledge of anatomy was very deficient, and whenever I had occasion to use this method of anesthesia I sent my patients to Dr. Molt. He does nerve blocking for me; he sends the patients back, and I have continued my operations successfully in probably a dozen cases.

I fully realize the importance of this work, and if our younger

men would take it up and develop a technic in its use that is as near perfect as can be, excellent results would be accomplished. It is the coming thing in dentistry, and those who contemplate undertaking it should be thorough students of anatomy and master the technic in order to achieve the most gratifying results.

DR. SMITH (closing):

I do not find adequate words to express my appreciation to each of you for the kind words you have spoken with reference to my subject. In discussing this subject, it has not been possible to present it to you in a way that I would like and I hope you will fully realize that it is impossible for one to cover a subject in one evening which represents so broad a view as that of Anesthesia.

I am a staunch believer and dyed-in-the-wool follower of the methods that eliminate pain. The question of anesthesia is of great magnitude and of vital importance to our profession and we should recognize the importance of properly applied anesthetics. The careless administration of both general and local anesthetics should be discontinued and relegated to the rear of progressive dentistry. Carelessness in the administration of anesthetics is usually done by the practitioner having limited knowledge of the physiologic and toxic effect of the agents used. It is impossible for me to properly unveil to you this broad and unlimited subject in such a short space of time. In my experience, I have had the pleasure of reading, lecturing and listening to a number of papers and taking part in discussion upon important subjects while attending numerous society meetings, both medical and dental. It has been my observation that very little has been said about freeing our patients from pain. You know, how much has been said about standardizing crown and bridge work and depicting the technique which envelope perfect root canal work. I say to you that when the methods of conquering pain and shock have been standardized as much as possible, that we have added a material diadem in the crowning elevation of our profession in the feelings of the laity.

You may place me on record in saying that the time will soon be at hand when the dentist who inflicts pain will be in the same class as the practitioner who does improper bridge work and root canal work. I am sometimes termed an enthusiast on this all-vital and important subject, but that is of small moment for I have been

convinced what the elimination of pain in dentistry has done for the practitioner who has eliminated it from his practice and well do these practitioners know how patients immeasurably appreciate dental treatment with the pain left out.

Some say to me that nerve blocking is complicated and technical. Permit me to say to you that local anesthesia deserves and merits the same careful thought, study and consideration as other scientific subjects of such vital importance. Surely nerve blocking should not be used by an operator who does not understand it, any more than a layman should practise dentistry. This requires study and proper application just the same as the technique for perfect root canal work. Let me say to you that when a thorough knowledge of the anatomical parts are mastered that at least seven-tenths of the technique is accomplished. No well-meaning and progressive practitioner can afford to miss the opportunity by reason of the fact that some study is required. My advice to those who would attempt nerve blocking without first familiarizing themselves with the various phases, is that the hypodermic syringe should be left in the cabinet or turned over to the dentist who recognizes and is willing to meet the demands of the public. To those who would master the subject of anesthesia in all its phases, will find that it is of immeasurable value and a source of pronounced appreciation and gratification. Science has given both medicine and dentistry countless new ideas during the past few years. It has blazed and broadened immense important fields to the professional man who would but listen to the signal and who wishes to rise in the ranks of his profession.

The field of anesthesia, scientifically speaking, is of comprehensive magnitude, and the dentist should by no means look upon it as a mere side line in dentistry or medicine. It is wonderfully satisfying to observe the pronounced advancement in the science of anesthesia and it is especially gratifying to see the vast number of our profession taking hold of the opportunities which science offers to-day.

So many points have been brought out in the discussion that it is impossible for me to attempt to cover them in detail. However, I will try to discuss as many questions as possible. As I have already stated, this subject is a very important and broad one and the dentist who enters this field thinking that he can familiarize himself in a short time with the subject, will be very much mistaken

and disappointed because he will find it so broad and will encounter so many failures that he will become discouraged and it is very wise for him not to attempt it at all. When I make this statement I have particular reference to the making of the deep nerve blocking injections and the administering of a general anesthetic in all kinds of cases. When I speak of anesthesia, I mean all phases of it but I fully realize that it is not possible to make professional anesthetists out of the dental practitioner. It would be wrong to leave the impression that it is necessary to be a professional anesthetist which requires years of constant study in order to apply anesthesia in operative dentistry. Operative dentistry does not require only in exceptional cases a prolonged period of anesthesia, should a general anesthetic be employed. Most all of the operations coming under the observation of the operative dentist require only a few minutes time and this is greatly in favor of the operator. It is quite different administering a general anesthetic to a patient for an operation of short duration than to administer an anesthetic to a patient for a prolonged Major surgical operation. If the operation is for Major Surgery and the patient is to remain under the influence of the anesthetic for a long period of time, then the question of the patient's physical condition enters into the situation. It then requires strict observance on the part of the anesthetist to detect any pathological symptoms of the respiratory and circulatory systems. I do not mean to convey the impression that it is always safe to administer a general anesthetic to a patient for even a brief period, and disregard physical diagnosis for it is in the unsuspected case that we are confronted with alarming symptoms of danger, but you must agree with me that the anesthetic of short duration, say for three or four minutes, is not accompanied by all the dangers as an anesthesia which extends over a period for say one hour.

General anesthesia is not necessary for operative dentistry only in certain cases but is of inestimable value to the Exodontist and the Oral Surgeon. Nerve blocking to a considerable extent has supplanted general anesthesia in operative dentistry, oral and major surgery. I think every practitioner of dentistry owes it to his patients to familiarize himself with the modern methods now at his disposal for eliminating pain and I am quite sure that every patient will greatly appreciate such service. It has been my pleasure to give post-graduate instruction to a number of Study Clubs and to various

Dental Societies, and it has been my observation in talking to numerous members of the profession that they have a very meagre conception of what can be accomplished through the medium of local anesthesia in its various phases. Whenever a dentist does not know the difference between nerve blocking and terminal anesthesia there is something wrong. It is self-evident that he has not studied the subject and it is also evident that he cannot apply modern anesthetics and in this instance nerve blocking in his practice with as much satisfaction as a dentist who is thoroughly familiar with the subject. Nerve blocking is only a branch of local anesthesia. The terminal method is another branch. As above stated, local anesthesia is divided up into numerous sub-divisions. Nerve blocking is a method of producing anesthesia in a circumscribed area by injecting the solution into or near a nerve trunk at a point distant from the field of operation and that point of injection may be at any point between the periphery and the brain. If an operation is performed under the terminal or filtration method, the solution is injected into a circumscribed area at the point of operation.

One of you gentlemen spoke about nerve blocking being discredited by some men. Certainly, this is the case, so have gold inlays, and certain forms of crown and bridge work. I do not know of anything which has not been condemned by certain members of our profession and it is quite natural that a certain percentage of dentists will not be in favor of local anesthesia any more than they will all agree that all teeth should be saved. I am quite sure that many of these dentists who do not employ local anesthesia in some form or another in their practice or condemn the other fellow for using it, that if the truth was known about the matter, we would find that they have not familiarized themselves with what can be done with local anesthesia in all of its phases. Tell me, if you will, if there is anything in dentistry that 100% of dentists agree upon. Also tell me if there is anything in dentistry that is 100% success. We have men in the profession who do not believe in any kind of an anesthetic, at least they say so and still they discourage to a certain degree, other practitioners from taking it up. Let me say, the time is drawing near when the leading dentists of this country will not inflict pain while operating. Why is it that the laity at large is afraid to have dental operations performed. We hear remarks made by the laity to this effect, "I must have some dental work done, but I have

been putting it off for a long time, and you know I just dread to start? I am so afraid that it will hurt. Who is your dentist and does he hurt you?" It is the first thing they think about and not whether or not the dentist can restore the broken down tooth with a fine inlay and have it polished perfectly with the margins, thus and so. I know you will agree with me that the patients consider the pain connected with dentistry. The dentist who established a reputation of establishing good service coupled with the elimination of pain, is the man who is going to enjoy a very large practice and it will be a pleasure to him to render such service. I do not know of any better way or any more ethical way for the young man to establish a reputation than to eliminate pain incident to operations. It is certainly a legitimate way of building up a good practice.

The co-operation of the patient for nerve blocking must be considered. Let us take a nervous, hysterical patient for instance; it stands the operator in hand to obtain the patient's confidence before attempting to make any nerve blocking injection. After he has obtained their confidence and can then follow this up with skilful technique, he can very easily prove its value to them. In some cases it may be advisable to employ a preliminary sedative with the hysterical or nervous patient and in case this is deemed necessary, bromural or validol will be found efficient.

Gentlemen, there is something more in dentistry than mere crown and bridge work. When we can eliminate pain from our operations, we are doing a great good for humanity and at the same time we are placing our patients in a condition so we can do better operative work, and we are not handicapped with resistance on the part of the patient which is the case so many times when a pain relieving agent is not employed.

In answer to Dr. Ames' question relative to idiosyncrasy on the part of the patient for novocain, I wish to say that this is a matter which must be observed with each individual. You cannot tell by simply looking at a patient, whether or not he or she possess an idiosyncrasy for morphine, cocaine or iodine or any other drug which we employ. Many times our patients will tell us they will not tolerate certain drugs and we must believe them to a certain extent and we should administer the suspected drug with caution. Even by physical examination, you cannot always say that this or that patient does not possess an idiosyncrasy for this or that drug.

We gain this knowledge only through practical experience. I have made this statement a number of times in my various lectures. "Don't see how much of the solution you can inject and not produce a toxic effect, but see how little you can use in order to obtain the desired results." Take for example, the patient who comes to your office in a poor physical state and desires all their teeth removed or considerable operative work. It is not good practice to attempt so much operating at one appointment.

We know from the pharmacological tests of novocain and from experiments which have been made, not only in the laboratory but by various practical tests, that it is less toxic than cocaine. From personal experience, I believe that novocain is at least 10 times less toxic than cocaine. The individual who cannot endure two cubic centimeters of a 2 per cent solution of novocain, each cubic centimeter containing 1/1600 of a grain of suprarenin is in a greatly impaired physical state of health and could not in most cases be able to come to your dental office for treatment. This is as near as I can answer Dr. Ames' question. The only thing we can do is to examine the patient carefully and if we can determine the patient possesses an idiosyncrasy then we must take due notice thereof and govern ourselves accordingly.

I wish to compliment Dr. Roach with reference to what he said regarding the promiscuous use of anesthetics in dentistry and wish to say I agree with him in every sense of the word. Nerve blocking is like everything else in the practice of dentistry, some dentists take advantage of it and attempt to use it regardless of their knowledge of the subject. We can see the hand writing on the wall now, and the same will happen to nerve blocking in the hands of a small percentage of dentists just the same as it did with nitrous oxid-oxygen. Hundreds of men are taking up nerve blocking without giving it any consideration whatever. Many are going into the subject blindfolded attempting to make deep nerve blocking injections without familiarizing themselves with the subject in all of its details. What I mean by seeing the handwriting on the wall is that a large number of the dentists who take up this subject with the idea that it does not involve much study and practical application will meet with many failures, become discouraged and finally give it up. On the other hand, a large percentage of dentists will go into the subject just as they did in cavity preparation, inlay technique, crown and

bridge work, and they will become skillful in the technique in all of its phases and you will not be able to drive them back to the old methods.

Dr. Kester made an excellent remark in his discussion when he spoke of dental nerve and in answer to this, Doctor Kester, I wish to say that quite a number of operators are using their nerve in making injections instead of using real technique.

Dr. Knowles spoke of anesthesia in the army. This method will be proven of great value in army surgery. The extra-oral method will be of greater value than the intra-oral method in anesthetizing the second and third divisions of the fifth nerve due to the fact that it will eliminate possible chance of infection which no doubt will be present in the injuries of the face and jaws. It has been my pleasure to give instruction to a number of men who are going in the service and I have taken particular interest in dwelling upon the technique for the deep injections. I am quite sure that time will tell us that nerve blocking in oral surgery in the present war will have relieved many a soldier of pain while undergoing the necessary surgery.

The past summer it was my good fortune to give a series of lectures and clinics in the way of post-graduate work to the Study Club at San Diego, Calif. The dentists made arrangements with the Colonel who was in charge of the troops at San Diego for clinic work. We held our clinic at the Army Camp which lasted for one week and it was very gratifying to all of us to be able to render service to something like 200. We found the mouths of some of these soldiers in a deplorable condition. We examined and did operative work for as many as we possibly could during the time we were there. We did extraction of teeth, removal of pulps, cavity preparation, etc. I did the same kind of work under the auspices of the Little Rock Dental Society, Little Rock, Ark. This was at Camp Logan H. Roots where a large number of soldiers were examined and treated.

At Salt Lake City, we did our clinic work on the inmates at the State Penitentiary. To the best of my knowledge, we examined something like 200. In nearly all of these cases nerve blocking injections were made.

With reference to collapse and shock under novocain anesthesia, I regard suprarenin as one of the greatest factors in produc-

ing this condition as some patients are very susceptible to suprarenin. It is a very powerful drug, as it increases blood pressure enormously causing vaso-constriction of the arterioles. A number of dentists who have experienced cases of collapse have attributed them to the novocain, while if the truth of the matter was known, they were due to the action of suprarenin and to the enormous rise in blood pressure. We must remember this, that the more suprarenin we inject, the longer the period of anesthesia and the less injected the shorter the period of anesthesia.

I was very glad to hear Dr. Knowles express himself with reference to the new method of intra-osseous anesthesia. I call this the "missing link" in nerve blocking. Those of you who have been making nerve blocking injections are aware of the fact, it is not possible to reach the middle superior alveolar branch of the second division of the fifth nerve with the needle. This nerve descends in the outer wall of the antrum and supplies the upper first and second bicuspid and a portion of the upper first molar, anastomosing with the anterior and posterior superior alveolar nerves, thus forming the outer nerve loop. I am frank in making the statement that more than half of my injections by the infiltration method for the three above named teeth have been rank failures in patients in middle or past middle life, due to the fact that the alveolar plate in patients of this age has become so dense that it is utterly impossible for the solution to infiltrate through it. Infiltration anesthesia is of value in the young patient, but in my experience it is of little value in the patient, say past 30 years of age. After meeting with many failures, I evolved the new method of intra-osseous technique which makes it possible to anesthetize these three teeth with very little solution and no laceration. It is possible to block the upper sixteen teeth by making two posterior superior alveolar nerve blocking injections and two intra-osseous injections. These four injections are sufficient for cutting down the teeth, cavity preparation, pulp removal or any operation involving the teeth, alveolar process and buccal tissues. In case the teeth are to be extracted, in addition to the four above named injections, the anterior palatine and nasopalatine branches which form the inner nerve loop are blocked. This method of intra-osseous anesthesia eliminates to a great extent any infection, eliminates trauma and hemorrhage.

I wish to thank Dr. Brophy and Dr. Johnson for their kind

complimentary remarks with reference to my work and wish to state that it is not possible for me to find words adequate to thank Dr. Brophy for his kind advice to me when I was contemplating taking up the study of medicine for it was his kindly advice that guided me along this line and I assure him that I will never forget it. I also wish to thank him for his kind invitation to come to his clinics and demonstrate nerve blocking. Dr. Johnson spoke of the tribute I paid to the members of the profession who have been instrumental in raising the standard of our profession. I wish to state these men deserve a tribute, for much credit is due them for the most valuable work they accomplished, and as a result of their work our profession enjoys a position among the leading sciences of today.

In conclusion, allow me again to pay respect to these men of the past who laid the foundation of and built the system of teaching which has placed our profession upon the plane it enjoys today and it now draws tribute from every other fundamental science. We live in an age when history is being made rapidly, when new names are constantly being presented to our minds; when new achievements and great successes are being made; when startlingly brilliant things are being done. This is an age of big things, of vast achievements, so much so that many are felicitously inclined to look upon success as something that is won with the more exalted stations of life and epoch-making events. In the minds of many, success is something given only to the fortunate few to accomplish. The dentist engaged by day in the performance of his duties which requires mental activities, such for instance as the dentist is called upon to do, cannot formulate plans, suggest ideas or think consecutively upon the matters that are of vital interest to his advancement. This necessitates burning the midnight oil. There are few professional men in this world who have attained to any degree of success without having worked for it; as there is no excellence without great labor, so there can be no success worthy the name, that has not cost its possessor numberless nights of mental toil. The sooner a young man realizes that if he would succeed in this world he must lose sleep and meet the many drawbacks which confront him, the better it will be for him. Success means that someone has lost sleep. Fifty diplomas framed in gold do not mean anything if the possessor is not capable of backing them up with a high order of

ability. Every young man who is graduated from a medical or a dental college, and every man who practices medicine or dentistry, owes to his profession a duty. Few of the younger graduates realize to what extent they are indebted to their profession. They are not the only ones who fail to realize this. Many of the older practitioners have gone on year after year regardless of the fact that they have given nothing to the profession from which they have received so liberally. We speak now solely with reference to the giving of knowledge to the general fund of professional experience and proven facts. A dentist or physician with only one idea, all aglow with enthusiasm will accomplish more than the ripe scholar with a thousand grand thoughts hidden away in pigeon holes.

I thank you.



THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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THE READING OF GOOD BOOKS.

"Of the making of books there is no end," says a writer of the past in what might easily be interpreted as a plaintive tone, and yet no real lover of books will ever lament the fact that so many of them are issued. Books have been a more dominant factor in molding opinion than any other single factor. Books work quietly, persistently and powerfully, either for good or ill; and be it said to the credit of most writers that more good than harm is done by books. Usually if a book is harmful the alembic of public opinion forces it into oblivion, and in the ultimate it is only the worthy in literature that lives. Books have made it possible for us to say that "there is no past," because by reason of books the past is constantly being projected into the present. What a wealth of information both past and present is continually laid at our doors through the medium of books. Books bring solace to the mind in hours of deep distress, and while away the time in our lighter moods.

A friend of the writer said the other day, holding a book lovingly in his hand: "After all, I imagine that prison itself would not be wholly intolerable if one had access to good books." Through books we have the privilege of living over the best of the past, and of looking as far as is humanly possible into the future. The man who has not cultivated the habit of reading good books has missed much of the real enjoyment of life. Next to the satisfaction of doing great deeds and working great reforms is the pleasure of reading the recital of them as done by others. We live in the experiences and profit by the inspiration

of others as recorded in literature, and thus our printed books make the whole world kin.

In a profession like dentistry where so much is technical, books are an important factor in our progress. Without books the profession would merely grope along, passing from one reform to another through the slow and halting process of personal contact. The inestimable value of books must be apparent to any one who considers the avenues through which information is passed from one to another.

No dentist will develop normally in his profession without access to books, and no dentist will get the greatest pleasure from his work without a familiarity with the best in dental literature.

And it is a privilege that all may enjoy. Books are issued in these days in such numbers that in spite of the rapid evolution of ideas the profession may readily keep itself informed on the newest and best lines of practice almost as soon as these lines are developed. To those who do not buy or read books the advice is given to begin to cultivate the habit at once. It will bring more real and lasting satisfaction than any other one thing in professional life, with the possible exception of the cordial relationship which grows up between the practitioner and his patients. This latter is perhaps the greatest solace of professional experience, and even this may be largely enhanced by the knowledge gained in reading books.



BOOK REVIEWS.

DENTAL AND ORAL RADIOGRAPHY. A Text-Book for Students and Practitioners of Dentistry. By *James David McCoy, D. D. S.*, Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California, Los Angeles, Cal. With 123 Illustrations. Second Edition, 179 Pages. Published by C. V. Mosby Company, St. Louis, Mo. 1918.

The second edition of Dr. McCoy's splendid book has been called for in less than fifteen months from the date of the appearance of the first edition, which speaks sufficiently for its merit.

The work has been much enlarged and fifty new illustrations added. The author has uppermost in mind the idea that he is writing for beginners in X-ray work, and therefore he takes nothing for granted in his descriptions, and makes clear every step. The growing importance of the X-ray in our every day practice renders this volume increasingly valuable, and the careful revision given the work for the second edition brings it strictly to date. There is only one suggestion which the reviewer has to make which applies not only to the present author but to all writers on the X-ray. In interpreting films it is the common practice to call every shadow at a root end an "abscess." It has yet to be proved that all of these rarefied areas are abscesses, and it would be more logical to abstain from calling them abscesses until we are further advanced in our technique or in our interpretation of X-ray pictures. In many of these shadows there is no doubt that there has merely been a thinning of the bone from some disturbance following the death of the pulp—possibly years previously—and that at the time of the X-ray exposure there is no infection whatever and certainly no abscess. To diagnose abscess in every case may therefore lead to a misconception and to a wrong conclusion. Dr. McCoy's book as a whole is worthy of all praise and should be in the library of every dentist.

DENTAL ELECTRO-THERAPEUTICS, by *Ernest Sturridge, L. D. S.* (Eng.), *D. D. S.*, Fellow of the Royal Society of Medicine, Member of the British Dental Association, etc. Second Edition, Thoroughly Revised. 164 Illustrations. 320 pages.

Price \$2.75. Published by Lea & Febiger, Philadelphia and New York. 1918.

This book is divided into two parts—*Electro-Physics*, and *Electro-Therapeutics*. It gives a very comprehensive statement of the principles involved in the subject, and at the present time, when electro-therapeutics and allied subjects are so much under discussion, it is of especial interest. The author takes the reader into the fundamentals of the subject so far as its particular application to dentistry is concerned, dealing with such topics as "Dental Electrical Appliances," "Dental Radiography," "Ionic Medication in Dental Operations," etc. The chapter on the X-ray is especially complete and practical, and the work as a whole is worthy of the most careful reading by every practitioner of dentistry.

GENERAL PATHOLOGY AND BACTERIOLOGY FOR DENTAL STUDENTS.

By *Guthrie McConnell, M. D.*, Director of the Clinical and Roentgenological Laboratories of the Waterloo Medical Society, Iowa. Captain, Medical Reserve Corps, U. S. N., formerly Professor of Pathology and Bacteriology in the Philadelphia Dental College. Second edition revised 12mo of 314 pages with 109 illustrations. Philadelphia and London: W. B. Saunders Company, 1918. Cloth, \$2.50 net.

The growing importance of the subject of focal infections in their possible relation to systemic troubles renders this work of especial interest at this time. The author takes up the subject in its various phases, and considers the different theories of immunity—a question which will one day assume a greater importance in relation to foci of infection than it does today. A very complete chapter is the one on "Specific Micro-organisms," considering as it does the various organisms of infectious diseases of especial interest to dentists. The book concludes with a chapter on "Laboratory Technic," and this with the various methods of cultivating and staining micro-organisms rounds out a very clear and satisfactory consideration of the subject.

PRACTICAL HINTS.

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

To Relieve Pain in Aching Socket:—One-half inch selvaged edge gauze which has been immersed in Balsam of Peru may greatly relieve an aching and inflamed socket after operating.—*C. H. Turnquist, Minneapolis.*

Cleaning Blood From Instruments:—Remember that hot water coagulates the albumen of the blood and makes it stick—therefore, wash in cold water to remove the blood before boiling.—*Earle A. Thomas, Chicago, Ill.*

To Prevent Solder From Flowing:—Any portions of a crown or bridge to which it is undesirable that solder should flow are coated with ordinary ink or a lead-pencil mark after heating the piece. The borax is subsequently applied, and the solder will be confined to the desired areas.—*J. A. Wright, Chicago.*

Setting Crowns and Bridges:—Evans' Gutta Percha is one of the most valuable materials that we have in our office, and I have found that comparatively few dentists have ever used it. With it it is possible to set crowns and bridges as firmly as with cement and yet they can be removed with ease.—*O. D. Davis, Minneapolis.*

To Cure Sensitive Incisal Surfaces:—As age advances and the incisal ends of the teeth wear down, they sometimes grow very sensitive to acid foods. Procure a styptic stick such as barbers use to stop bleeding, and rub this on the sensitive spot and the trouble will be instantly relieved. This stick is also excellent for cold sores on the lips.—*James W. Cormany, Los Angeles, Cal.*

Bismuth Salicylate for Root Filling:—Instead of chloro-

percha I have used for twenty years for root-filling a paste made of bismuth salicylate and oil of cajuput. The oil is a solvent for gutta-percha. The bismuth comes as nearly being a permanent antiseptic as anything you can use. Be sure to get the salicylate instead of the sub-salicylate—the latter being so light that it will not mix to a smooth creamy paste. Mix on a slab for each case.—*F. C. Noyes, Jacksonville, Ill.*

To Avoid Air Bubbles in Plaster Casts:—After coating impression with separating medium apply a moderately thin mix of plaster to the entire surface of impression with a 1/2-inch oval paint brush (not camel's hair). When coated, immediately immerse brush in a glass of water, and finish pouring cast in usual manner. This avoids jarring of impression with probable fracture or distortion. Allow brush to remain in water. When necessary to use it again the plaster will shake or jar out readily and brush is as clean as when new.—*Lester N. Roubert, Chicago.*

Care of the Tooth Brush:—Many articles have been published in the dental journals on the septic state of the tooth brush as ordinarily cleaned before and after use, and advising how to treat it to produce a nearly sterile condition. Manufacturers of dental pastes and mouth washes have showered the profession with circulars, claiming efficiency for their products to make the brush sterile, and proving it to their satisfaction by comparative tables of bacterial counts from cultures made from brushes, before and after the brushes have been in contact with their own mouth wash or paste. It is not in my recollection that boiling water has been recommended for that purpose. It may have been but I have never found it in the journals. This may be owing perhaps to a supposition that boiling water injures and destroys the brush, which in my experience has not proved to be the case. Have a kettle of water on the gas or other heater; before brushing the teeth, pour generously of the water when boiling over the brush; after brushing the teeth pour boiling water again over brush before putting it away, preferably in some closed container. After cleaning the teeth with floss and brush, rinse the mouth with tepid or warm water which will remove the loose foreign particles better than cold water which has a tendency to make them adhere.

This treatment of the brush with boiling water seems not to injure it. I have subjected my present brush to it for at least six months without damaging it in the least. I have made no laboratory experiments to determine the comparative efficiency of the method; it however seems to me that a germ that has had boiling water poured over it would be a pretty sick bug, disinclined for immediate mischief.

This method of course is practicable only where access is had to boiling water.—*Vincent Fischer, Chicago, Ill.*

MEMORANDA.

MONTANA STATE DENTAL SOCIETY.

The Fifteenth Annual Session of the Montana State Dental Society will be held at Butte, July 18, 19 and 20, 1918. R. R. Johnson, Secretary, Great Falls, Mont.

CANADIAN DENTAL ASSOCIATION.

The Canadian Dental Association has accepted the very kind invitation of the National Dental Association to meet with them in Chicago, August 5-9 next. Sydney W. Bradley, Sec., Ottawa, Ont.

STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the North Dakota State Board of Dental Examiners will be held at Fargo, July 9th. All applications and credentials must be in the hands of the secretary July 1st. For application blanks or further information address the secretary. W. E. Hocking, Sec., Devils Lake. N. D.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The next meeting of the National Association of Dental Examiners will be held in Chicago, Ill., August 5th and 6th at the Auditorium Hotel. For further information address the Secretary, Dr. J. A. West, 417 Utica Building, Des Moines, Iowa.

PSI OMEGA FRATERNITY.

The National Alumni Chapter of the Psi Omega Fraternity has established headquarters during the National Dental meeting at Room No. 230. Auditorium Hotel.

The Business session of the National Alumni Chapter will be held Monday, August 5th, at 3:00 P. M.

The Psi Omega banquet will be held in the Florentine Room of the Congress Hotel at 7:00 P. M., Monday, August 5th.

Psi Omegas who expect to attend the banquet should communicate at once with Dr. M. M. Printz, 4235 Lake Park Ave., Chicago.

THE FORSYTH DENTAL INFIRMARY FOR CHILDREN.

140 The Fenway, Boston.

Permanent Staff Appointments.

A competitive examination of graduates in dentistry (of less than three years standing) for appointments to positions on the Permanent Staff for full and one-half time service will be held early in June at the Infirmary.

Appointments will be made for one or two years as follows:

Full time service requiring operating five and one-half days a week at a salary of \$1,000 a year.

One-half time service requiring operating six half-days a week, either forenoon or afternoon, at a salary of \$400 a year.

These appointments will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry and to "qualifying" in the practical work of the clinics during one month's trial.

Members of this staff will be entitled to the advantage of reports and clinics by experts in the various branches of dentistry from different parts of the world in addition to the numerous regular clinics and lectures.

Operators after serving four months are eligible, by qualifying, for appointments in the special clinics where post graduate work is given.

The operators on this staff have the advantage of the clinics and lectures of the Post Graduate School of Orthodontia.

The Infirmary clinics provide unusual advantages in the various departments of the institution where Operative Dentistry, Orthodontia, Nose and Throat and Oral Surgery, Extracting, Novocaine Technic, Radiography, Pathological Diagnosis and Research Work are continually carried on.

The average number of cases treated daily is more than 450 in all departments.

All material and necessary operating instruments will be furnished; up-to-date apparatus including electric engines, sterile instrument trays, fountain cuspidors, compressed air, and the modern operating-room-type of lavatories are available for use.

A diploma for service will be issued by the Trustees to each member of this staff who has completed this term of service in a satisfactory manner.

Applications for the above positions should be made not later than May 18th.

Information and the date of examination will be furnished to those interested.

Harold DeW. Cross, D. M. D., Director, 140 The Fenway, Boston, Mass.

NATIONAL DENTAL ASSOCIATION.

Special Announcement of Hotels and Garages.

The National Dental Association will hold its Twenty-second Annual Meeting in Chicago, August 5-9, 1918. The headquarters will be at the Auditorium and Congress Hotels situated on Michigan avenue, corner of Congress street. All meetings, clinics and exhibits will be held in these two hotels, which are connected with an underground tunnel.

The important announcement at this time must be the warning "RESERVE YOUR ROOMS AT ONCE. MAKE RESERVATIONS BY MAIL DIRECT TO THE HOTEL OF YOUR CHOICE. ARRANGEMENTS FOR PARKING CARS SHOULD BE MADE DIRECT TO THE GARAGE."

The following is a list of hotels and rates:

Auditorium Hotel, Michigan Boulevard and Congress Street.

Single room without bath, \$1.50 and \$2.00 per day.

Single room with bath, \$2.50 to \$4.00 per day.

Double room without bath, \$2.50 and \$3.00 per day.

Double room with bath, \$4.00, \$5.00 and \$6.00 per day.

Congress Hotel and Annex, Michigan Avenue and Congress Street.

Room, detached bath (one person), \$2.00, \$2.50, \$3.00 per day.

Room, private bath (one person), \$3.00, \$3.50, \$4.00, \$5.00, \$6.00 per day.

Room, detached bath (two persons), \$3.00, \$4.00, \$5.00 per day.

Room, private bath (two persons), \$5.00, \$6.00, \$7.00 per day.

Suites: Two connecting rooms, private bath (two persons), \$6.00 to \$10.00 per day.

Three or four persons, \$8.00 to \$14.00 per day.

Corner Suites: Parlor bed room and private baths, \$10.00 to \$50.00 per day.

The following is a list of garages and rates:

Our rates for storage are \$1.00 for the first 24 hours, and 75 cents each additional 24 hours. At these rates cars can be taken out for driving and reparked during the same 24-hour period at same charge. City Auto Parking Company, A. V. Jackson, Gen. Mgr., Michigan Ave. and Lake street, Chicago, Ill.

We are prepared to take care of thirty or forty cars during your convention, at a special rate of 75 cents per day, providing they notify us of their identity as a member of your Association. Down Town Garage, A. J. Bemmer, Mgr., Michigan Blvd. and Eighth St.

One thousand cars can be parked in Grant Park (on the lake front) free. The City of Chicago furnishes policemen to watch these cars. J. P. Buckley, Chairman, Publicity Committee.

GENERAL CLINIC.

Arrangements are sufficiently advanced to promise the members of the Association that the General Clinic will be one of the great features of the 1918 meeting.

In conference with officers of the National Dental Association, the Committee in charge of the General Clinic carefully considered the nature of the clinic to be presented this year. After trying for the past few years new features in conducting the Clinic Program, it is the belief that a greater number will be served and benefited by holding a General Clinic, grouped into Sections:—namely—Operative, Prosthetic, Crown and Bridge Work, Orthodontia and Prophylaxis.

To make it National in character, the President of the different State Societies was requested to appoint two Clinicians and two associates from his State Society.

Up to date, thirty-nine State Societies are represented and the remaining nine will be represented before the publishing of the Official Program.

Far away Alaska is sending two and two associates, and to make the Clinic more than National, in fact an allied affair, the Canadian Dental Association has promised ten of the best Clinicians in the Dominion. In addition, there will be a few Unit Clinicians which will demonstrate principles that require more than two men.

It is safe to say that this Clinic will be unique in the sense that every man on the program will either be present or be represented by his associate. Don M. Gallie, Chairman General Clinic.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS NOTES AND NEWS

COMMUNICATION FROM THE PRESIDENT

Who should receive the services of the members of the League? Every worthy man within the draft age whether he may or may not be in the service of his country at the time.

Let us forget all but the one thought—that we must do our utmost to help strengthen our great National Army. We must help make fighters to protect our flag and we must do it NOW. Tomorrow may be too late.

One of our members recently arose at 3 A. M. and worked until 5 that one of "our boys" might go away in comfort. It is noble work and thousands of instances similar to this one might be related. The pride we feel in the way our profession is meeting the crisis cannot be expressed in mere words.

Every man you make dentally fit will fight for you in France.

HAVE AN ARMY OF YOUR OWN

It is well, perhaps, at this time to remind our members that all dental service rendered in the name of the League must be free. There can be no devia-

tion from this rule without nullifying the great principle upon which our organization is founded.

We are rendering an inestimable service to our country and when we shall have completed our work, let it be said that we gave freely, gladly and with true patriotic spirit.

Our third annual meeting will be held on August 7th, in conjunction with the National Dental Association, Chicago, Ill.

We are arranging a program which will be of absorbing interest and urge every member who belongs to the N. D. A. to join us in the enjoyment of the good things we are preparing.

J. W. BEACH.

COMMUNICATION FROM THE DIRECTOR GENERAL

Regarding the editorial* which was enclosed with the letters you sent me to read, would say that it looks very much like German Propaganda, although I presume it was printed in all innocence, but if the Editor had stopped awhile to consider it, undoubtedly he would have adopted another form of criticism.

The Preparedness League is working under the supervision of the Surgeon-General's Office. That being the case, one must realize that before this Questionnaire was made up, very serious consideration was given the form of the questions, and each question was devised for a specific purpose. The general purpose of all questions is to help us in securing new members for the Preparedness League in order that the work may be increased to such an extent that the League may be of more efficient help to the Government.

Regarding the matter of paying for dental service by those who are well able to pay. A dentist is asked to give but one hour a day to the registrants. He would, therefore, be giving but one hour of free dental service whether the man could pay or not, and this surely is not a great hardship on anyone. If the Registrant pays for the service, then directly it ceases to be voluntary service on the part of the dentist, and is therefore, not Preparedness League work. There is no objection to a man who is able to pay for the work, going to his own dentist to have the work done and pay for it, but such service should not be recorded as Free Dental Service or as Preparedness League work, as it is work done strictly in a private capacity and is in no way connected with volunteer service. On the other hand, if any Registrant, however well able to pay, is willing to accept free service at the hands of the Preparedness League, it seems very little for the League to take care of him in comparison with the man offering his life for our protection, and I should dislike very much to hear that any dentist would refuse volunteer service under these circumstances.

Making appointments with individual members of the drafted men, is, I think, not practicable for the reason that it is only through organized channels that the dentists offering their services, can be assigned their fair proportion of the work. If work was continued on each mouth until it was put in good condition, it would work out to the advantage of the few and the disadvantage of the many. If a Registrant needs a second or third appointment to make his mouth dentally fit, refer him back to the League's Headquarters for such appointments, and if time permits, there is no doubt but that he will be taken care of; meanwhile, those who come after him are not being neglected.

On the other hand, if a Registrant requires a second or third appointment and the dental operator is interested enough in his case to finish the work, then additional appointments may be made with the Registrant providing they do not interfere with the time he has already pledged the League. In other words, only one hour is to be given each Registrant unless other provision has been made for him either by the dental operator or by the Pre-

paredness League. The *once over* for each Registrant is the important thing to be borne in mind.

When appointments, either first or second, are not kept, the result, of course, is loss of time. When this happens it is unfortunate and must be considered a part of our personal sacrifice, as there seems to be no way to guard against it. New appointments should not be given those who break their first appointments, but they should be referred back to the League's Headquarters and sent back to the State Director.

CHAS. F. ASH.

*Editorial from a Western newspaper in which the "Questionnaire," asking dentists to join the league, was criticized.—Ed.

FORM 3-C CARDS.

Each dentist should chart the operations performed, sign his name and apply the Stickers furnished by each State Director or County Director. If the operator has no Sticker, cross out the name of the Selective on the address side and write Lieut. W. A. Heckard, D. R. C., 50 East 42nd Street, New York City, across the card and mail at once.

When the work on each Registrant is finished it should be recorded on Form 18 Card and when this Form 18 Card is filled up and duly signed it should be dropped in the box and sent back to the State Director. Each Card takes care of itself and records work done to date.

R. T. OTTOLENGUI, Director of Publicity.

BOARD OF DENTAL EXAMINERS, STATE OF WYOMING

The Wyoming Board of Dental Examiners will meet at Cheyenne, Wyo., on the 25th, 26th and 27th of June, 1918, to examine applicants to practice in this state. Further information and application blanks, address Peter Appel, Jr., P. O. Box 643, Cheyenne, Wyo.



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COMBATING MOUTH INFECTION.*

BY EDWARD A. ROYCE, D.D.S., CHICAGO, ILL.

The most important service the dentist can render humanity is to relieve it of mouth infection. This fact has become so generally recognized, that to-day, we do not look upon operations performed in the mouth as influencing the teeth only, but each and every operation has to pass the test of what future influence it will have upon the general system. In fact, dentistry is now considered one of the most important factors in preventive medicine. There is no operation performed in the mouth that does not have a more or less direct bearing upon the future health of the patient, and this influence is so direct and so great that we cannot avoid the responsibility it places upon us. To meet this new responsibility it is necessary that we should study carefully all methods of practice, and select without prejudice those that are best.

Many of our patients come to us suffering from an infection, for which the mouth is responsible. These infections are generally derived from two sources, one in the apical spaces, and the other at the cervical portion where we find pyorrhea. It is in the relief of this class of patient that we are especially interested tonight.

In deciding upon a course of treatment for infection, not only should the condition of the mouth be ascertained, but also that of the general system; for this purpose radiographs should be made, a blood count taken and if it indicates much infection a complete physical examination should be required. This is a necessary part of the diagnosis, and will also be found invaluable for future reference. We verify the radiograph by the findings in the mouth, noting all indications of infection in the apical spaces, carefully checking up the destruction of process, and measuring the depth of the pockets, especially notice the condition of the gums, study the occlusion so that any mal-occlusion may be corrected as well as mal-posed

*Read before the Odontological Society of Chicago, May 7th, 1918.

teeth. The defective points of contact must also be restored. The calcareous deposits are of great importance and all roughened fillings and banded crowns that irritate the gingival margins should be examined and noted.

I cannot emphasize too strongly the importance of a physical examination where the blood shows considerable infection. This is illustrated by a case that came to me recently in which the patient said he was perfectly well except for periods of sneezing with such a copious coryza as to interfere with his business. An examination of the mouth showed some pyorrhea and three abscesses—two very bad. I asked for a physical examination and when the report was received the patient was greatly surprised to find it showed some indications of tuberculosis in the lungs—probably passive but possibly active—an infection of the nasal septum, some valvular disease of the heart, high blood pressure and a slight trace of albumen in the urin. The extraction of the two badly abscessed teeth stopped the sneezing and flow of mucus from the nose at once, and but for the physical examination, the patient, knowing nothing about the other troubles, would have been content to stop treatment when the active symptoms that annoyed him were relieved, but now he is anxious to have all infection in the mouth thoroughly eradicated, believing his system will thus be better able to combat the other infections indicated. You can readily see the advantage derived from this examination, and when the mouth is cleared up, by having another examination made we can show the patient just how much his condition has been improved. In one of my early cases in this line of work I cleared the mouth of infection by extraction and pyorrhea treatment, relieving at once a bad case of catarrh which had troubled the patient for thirty years and which had been under treatment by some of our best rhinologists, without benefit. A year later the patient reported the disappearance of a goiter of long standing which had resisted all treatment. While the patient attributes all this improvement in his physical condition to the elimination of mouth infection, still I have nothing to show such is the case, as at that time I did not realize the necessity of the physical examination, and I had no records made of his condition. This case convinced me that a general examination was a very essential part of a dental diagnosis, as it shows us the conditions we must meet and overcome, and is absolutely necessary in checking up results.

At the very outset we must decide which teeth can be saved and which must be removed. I once heard Dr. Harlan say that "One of the most important things in the treatment of pyorrhea was to determine which teeth to extract," and I fully agree with him. With each tooth we must decide whether the benefit to be derived from the use of the tooth for mastication and esthetic purposes, will outweigh the detriment to the system from the infection incurred by leaving it in the mouth. With the help of the radiographs we will probably find a number of pulpless teeth with rarified areas at the apices, indicating more or less infection in that region. I believe that all pulpless teeth are a menace, and all abscessed teeth are a positive and present menace, and should receive immediate and radical treatment, either surgical or otherwise. If the treatment is to rid the system of serious conditions, all apical infection should be eliminated without delay. All teeth that are hopelessly loosened should be extracted. It is estimated by some that 90 per cent of the infection of the general system originates above the collar. Not all of it comes from the apical ends of the teeth, we may have infection from the sinuses or from the tonsils, but a large proportion of it is caused by pyorrhea. The great prevalence and persistence of this disease, and the difficulty we find in arresting it, indicates there is some inherent weakness in the tissues surrounding the teeth, and I long ago became convinced that anything that would interfere with the circulation in those parts, was a predisposing cause of pyorrhea, in that it reduced the resistance offered to the invading bacteria. Some authorities, including Dr. Black, state that these tissues are amply nourished by the circulation, and this may be true of the gums, but other writers claim the nutrition of the process is deficient. Dr. Cazier of New York, in the June, 1917, *Cosmos*, says: "It is a well established fact in histology that the alveolar process is nourished by arterial spurs given off mainly at right angles from the principal arteries of the jaws, and that these spurs, ramifying in the cancellous alveoli, breaking up into capillaries, and returning as veins, and therefore end-organs in bony substance. The very nature, therefore, of the arterial mechanism carrying the blood supply, renders nutrition precarious, and it is perhaps never adequate in the majority of individuals, becoming markedly inadequate with the intervention of pregnancy or dis-

ease, or when advancing years render the arterial system less resilient, and consequently less efficient." This seems very plausible, as clinical experience shows us that these tissues, by reason of their lack of nourishment, fall easy prey to the ravages of bacteria that have penetrated the protection of the mucous membrane.

In the treatment of pyorrhea it is generally agreed that certain things must be done, such as correct the occlusion of the teeth, remove all deposits and other irritating substances, and maintain oral cleanliness, but there are other things of equal importance to be done, as you will see as we detail the treatment.

At the first sitting we should correct the mal-occlusions which in many cases can readily be done by the use of carbon paper and abrasive wheels, though in some cases the position of a tooth may have to be changed. A beginning may be made in the polishing of the crowns, which will take several sittings. The crown and necks of the teeth are to be polished to just under the free margin of the gums, all angles should be reduced to curves and all surfaces be made smooth. To do this it is not necessary to mutilate the teeth or remove the lines of strength and we should be careful to leave a smooth surface without scratches or grooves. At the end of the first sitting we begin our treatment to remove infection from the tissues surrounding the teeth. The first thing to do is a very thorough spraying of the entire mouth with a moist spray which is composed of medicated oxygen gas forced through ethel-borate; this is to clean out all the débris around the teeth and leaves a thin antiseptic film. Now with syringe or instrument we force the Dunlop pyorrhea paste down under the gums and into all the pockets, the paste being sealed in with the pocket packer. As the paste is an essential part of the treatment, I can best describe its action by quoting from Dr. Dunlop. He says: "This paste is a strong antiseptic composed of Borçsaure glyceryloxhydrat, alcohol and pip menthol; it inhibits bacterial growth and by its dehydrating properties performs the double office of dehydrating the toxins besides inducing the formation of a serous exudate into the pocket from the adjoining healthy structures, the toxins contained within the pocket because of the dehydrating influence of the paste yield up one molecule of water for each molecule of toxin, their nature is thus

altered and though still harmful in action they seem far less capable of exerting their former disastrous influence. As a result of the serous exudate which is caused to flow from all the tissues surrounding the pocket its passage through those structures supporting the fixed sanguinary deposits cause a loosening of the elements because of the fluid formation which gathers beneath their bases. This aids greatly in their detachment." This paste is sealed in by the pocket packer, which is a medicated paraffin preparation, the object being to retain the paste in position and prevent re-infection.

The second day the treatment is repeated, but the third day the tissues should be in condition for us to use the Dunlop Vapor. This is a medicated oxygen gas which is introduced under pressure into the ducts which traverse the gum tissues, the openings of which are found just beneath the gums at the cervical margins. They are most plentiful in the interproximal spaces. The gas needle should not enter the tissues nor the deep pockets. The first introduction of the gas should be at the mesial and distal of the cuspids and second molars. When penetrating the gums the gas produces an anemic flash and when this is seen the needle should be immediately withdrawn. This treatment is continued for three days, making five days' treatment altogether. Then the patient is allowed to rest for a week or ten days, when another series of treatments is begun.

It is so important that the working of this gas be understood that I will again quote directly from Dr. Dunlop. He says: "Each time the gas is introduced into the tissues in the first or succeeding courses, either by observation or inquiry of the patient, the extent of its diffusion through the tissues should be determined. In the presence of extensive involvement, or the absence of healthy tissue resistance, its range of transmission is subject to much variation. The gas shows a distinct predilection for diseased tissue, and when there is a severe extensive involvement of the local structures, it is found to have a greater latitude for its diffusion. In such cases symptoms referable to different structures, as the eye, ear, or tongue, elicited by questioning the patient, will betray the course which the gas has taken, and in such cases, its further use is absolutely contra-indicated, until by hyperemia a resistance is built up against its widespread dif-

fusion. This is accomplished by serum exudation of leucocytic infiltration into the tissues. At all times the active hyperemia is to be maintained by a careful use of the gas in those places before mentioned. Having given sufficient time, through rest, for the establishment of the leucocytic infiltration, its presence is thoroughly tested by introducing the gas into the mouths of the ducts surrounding every tooth, and when this leucocytic wall is found to have been fully formed, it will be seen that the area over which the gas may diffuse is greatly restricted. When this condition has been obtained, spreading of the infection is made impossible, and the gas may now be introduced into the pocket directly.

"By blowing the gas into the pocket, the organisms that are still engaged in the diseased process, are forced directly into this wall of leucocytes where they are destroyed. Their toxins are liberated and taken up by the blood to be distributed all over the body, where they come in contact with the body cells and cause the production of anti-bodies to be used in overcoming the infection. As every organism engaged in this process, without changing its nature by cultural manipulation, is used in this process of auto-vaccination, the anti-bodies formed will be specific for each of the organisms, and the infection will be wholly arrested."

We are now ready for the removal of the serumal calculus. It will be found that the peridental membrane has become so softened that this deposit is easily removed with dull files, with little disturbance to the tissue below. If you find that the serumal calculus cannot be easily removed, thorough instrumentation is indicated, of which I will speak later. The treatment is continued according to indication, care being taken not to over-treat, the bluish gray tint which we see in so many mouths indicating death of the cells, disappears, and we have in its place pink healthy looking gums which show renewed vitality. With the removal of all irritants and the disinfection and stimulation of the tissues we get a thoroughly regenerated tissue such as can be obtained in no other way. Later on I will exhibit radiographs showing a decided growth of new process about the roots of the teeth—this shows the reconstructive power of hyperemia. See Case No. 1. The Dunlop treatment is founded upon the theory that hyperemia is nature's way of building up the tissues by giv-

ing them freshly oxygenated blood, and this revival of tissue will be permanent until we have a return of conditions similar to those which occasioned the first breakdown.

Root surgery was introduced by Dr. Riggs, in his treatment for pyorrhea, more than fifty years ago, and in his treatment he



Fig. 1.

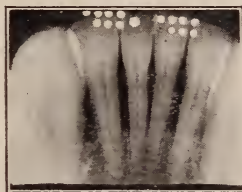


Fig. 2.

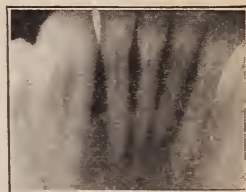


Fig. 3.

Case No. 1.—Figs. 1-2-3 show the improvement in general conditions and growth of process around lower incisors.

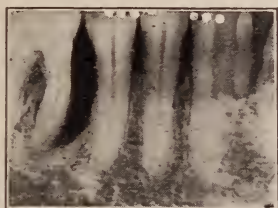


Fig. 4.

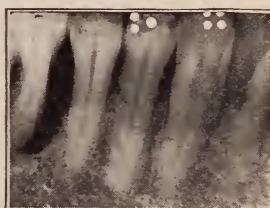


Fig. 5.

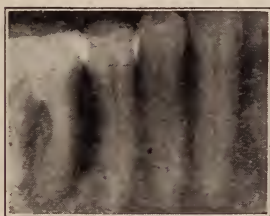


Fig. 6.



Fig. 7.

Figs. 4 to 7 show the improvement and deposit of bone after planing the surfaces, and clearing and polishing between the roots of a lower first molar.

included the polishing of the neck and roots of the teeth. Seeing the results of the beautiful work done by Dr. Riggs, induced Dr. Gerrish of Exeter, N. H., to begin the same line of work, adding to it the polishing of crowns, hoping thereby to make the teeth immune from decay, as well as pyorrhea, in which he was so successful that he made it his life work. Both of these men probably worked empirically, and it remained for Dr. G. V. Black to give

us a scientific reason for the comparative immunity from accumulations of calculus and gelatinous plaques when teeth were perfectly smooth. Dr. Black, in his Dental Pathology, page 89, says: "It was found deposits did not occur on the cover glass held in place by a gold frame unless the frame was made with an angle or rough edge which would give opportunity for the first deposit to occur." You will remember he wore a cover glass fastened to his artificial denture to collect calco-globulin which he found to be the foundation of calculus. If teeth are to be kept free from calculus either serumal or salivary the surfaces must be smooth so that the deposit will be delayed in forming, and if made, the removal will be easy.

There are some teeth from which the serumal calculus is not easily removed after the Dunlop treatment—the peridental membrane is necrotic and the only way to remove the serumal calculus successfully is with planes, so in my practice I combine the two methods, using the planing instruments for planing. There is some misapprehension on the part of dentists as to the difference between a curette and a plane as used in pyorrhea. Dr. Brophy, in his Oral Surgery, says: "We must curette the surface of denuded cement and bone." Now a curette is a spoon-shaped instrument designed for scraping, and it necessarily has a convex edge. To eliminate the infection we must not only take away the necrotic peridental membrane, but we must go in deep enough to remove the fibers that penetrate the cementum and thus reach the hard surface underneath. It is practically impossible to do this with a curette, because, on account of its shape and construction it cannot be controlled. The planing instruments are made upon the plan of a Japanese plane, the plane being drawn, not pushed, and the blade is at the rear instead of the center, as in the Yankee plane, the edge is straight in contra-distinction to the curved edge of the curette, and with it you can leave a smooth surface. The shank is so shaped that you can always control the depth of the cut and by taking off a succession of thin layers of cementum you leave an even surface to which the tissues will readily approximate themselves.

In a case of instruments there are eighteen sets, with eight instruments in each set, and six specials, making 150 in all. Each has its place in the case and as distinctly its own place in the

work to be performed. One might think there are more instruments here than are needed, but experience shows that while all are not used upon each tooth, there are none that are not useful upon occasion. These instruments are so designed that inaccessible places can be readily reached if the right instrument is selected and it is used with the special technique that has been developed for this purpose. Learning to sharpen the instruments is one of the very important features in this work. The instrument is held in a device in such a way that the angle to be given to the blade is accurately measured by a gauge, thus giving to every cutting edge the prescribed angle; the corners and edges are so shaped that the point can be worked down to the bottom of the pocket and pressed against the fibers of the peridental membrane, pushing them back far enough to allow the blade to cut up to their sides without tearing them loose.

To skillfully perform root surgery requires a perfect technique, plenty of time and the utmost delicacy of touch in the use of the instrument, so one may know by the feel of the blade just when the infected peridental membrane and outer layer of cementum has been removed, our fingers must be our eyes, as we are working in the dark, but even so, there is no more need of mutilating a tooth with a plane than there is of mutilating it with a burr or any other instrument, and only the careless operator will do so. With this treatment the healing is accomplished by hyperemia, induced by the trauma of the operation, and no medicine is used. All the exposed portions of the tooth should be smoothed and polished just as carefully as when using the Dunlop treatment. In the use of either of these methods much harm can be done to the teeth and tissues unless they are handled in a conservative and intelligent manner, and to avoid the mistakes and failures sure to follow experimentation, the best instruction should be obtained before attempting to use them. The combination of these treatments make possible a higher percentage of success than either of them used alone.

The routine practice of dentistry is a very trying occupation, many times relieved only by the approval expressed by our patients. The outspoken appreciation which we repeatedly hear from those patients who have been relieved from impaired vision, nervous debility, nasal troubles, heart troubles, and many

other results of systemic infection, are a sufficient answer to any criticism of this treatment. It is important that we should be able to recognize the conditions in our patients' mouths which lead to systemic toxemia, and I would especially emphasize this on account of the many cases to be seen of advanced pyorrhea, in mouths that had otherwise received good care. Some years ago

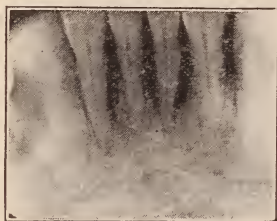


Fig. 1.

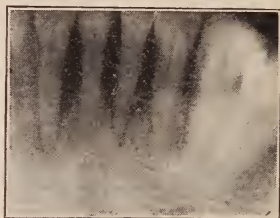


Fig. 2

Case No. II.—Figs. 1-2 show changes wrought in teeth by the removal of the serumal calculus.

a lady from out of town came to my office and asked, in the most apologetic manner, if I could send her to someone who would clean her teeth. Upon looking in the mouth I found some very beautiful gold work, and I said to her, "You have some fine work in your mouth, why do you want any other dentist to scale

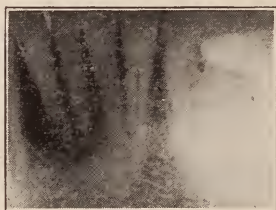


Fig. 1.

Case No. III.—Illustrates the condition of incisors, as presented.

your teeth?" and she then told me that this request to her dentist brought forth a reply that made her think it was almost an insult to ask a dentist to clean the teeth. I regret to say this sentiment is not a thing of the past—many dentists at the present time seem to consider it beneath their dignity to clean the teeth. I have with me radiographs of three recent cases, showing the almost complete destruction of the process around the lower anterior teeth. Case No. 2 came from a dentist who had displayed considerable skill in his operating, but the gums were very angry, show-

ing extensive inflammation, and the radiograph revealed an absence of process almost the length of the root; there were also extensive accumulations of serumal calculus, still the patient was assured that the teeth did not need to be scaled. Case No. 3 showed a copious flow of pus around the lower incisors, the inflammation of the gums was very extensive and the wasting of process was extreme, the socket being entirely gone from two teeth. The dentist had noted this condition some time ago, but told the patient nothing could be done for it. We are meeting conditions of this kind all the time, and I have come to believe this illustrates the attitude of the profession toward pyorrhea, be it indifference or ignorance, the result to the patient is the same—serious toxemia as the result of infection, and loss of teeth—all of which would have been averted if the conditions had been recognized and treated in the early stages.

Dr. Bloodgood of Baltimore, in his closing remarks before the National Dental Association some years ago, said: "The great majority of dentists prefer to do the more expert mechanical work, bridge work and other things that require great skill, they do not like to clean the teeth. The day is coming when more people's lives will be saved by keeping the people's mouths clean than by doing bridge work! How many cases of Bright's disease, that shortens the lives of many great men and women, have their portal of entrance through the teeth? So this thing you dislike to do, cleaning the teeth, may be the most important and expert thing you can do." This prophecy has already come true. The dentist of today should be working for the relief of mouth infection by the treatment of diseased tissues, but in the near future his great work will be to use all means at hand for the prevention of pyorrhea and decay.

THE MANAGEMENT OF TEETH HAVING RAREFIED AREAS.*

BY EARLE H. THOMAS, M.D., D.D.S., LL.B., CHICAGO, ILL.

The purpose of this paper is to help you to decide, in the light of our present knowledge of focal infections and their

*Read before the "Dental Review Club" of Chicago, April, 1918.

sequelae, what to do with the various types of teeth with rarefied areas showing at their apices in X-ray pictures. We are frequently having whole mouth pictures taken and almost invariably we find one or more teeth with areas of various sizes at their apices or around their gingivae, and in the absence of tenderness or looseness or other clinical evidence of disease in the involved teeth, the average dentist has great difficulty in arriving at any conclusion as to what he should do with such teeth, to say nothing of arriving at a convincing conclusion, and as a result his decision is not communicated to the patient in such an authoritative manner as to inspire confidence and respect in the dentist's judgment. In the following pages I will endeavor to give you a few suggestions as to what should be done under the various conditions which present themselves. To make this as clear as possible, I will classify the conditions into three different classes. See Fig. 1.

Class I is made up of teeth having incompletely filled root canals, with canal showing farther than root filling.

Subdivision a, with a very small area.

Subdivision b, with a larger area but not involving more than one-third of length of root.

Subdivision c, with an area involving more than one-third of root.

a. The small area is taken to be just a thickening of the pericemental membrane due to irritation of the toxins in the canal culture tube. Such a tooth should be treated and the canals thoroughly filled and the tooth X-rayed. Every year subsequently, this tooth should be checked up by the X-ray and at the first indication of the area becoming larger the tooth should be re-treated or the apex resected, or the tooth extracted and the socket curetted.

b. The larger area may or may not mean that the root end is denuded or partly absorbed by being bathed in pus. In either case the tooth should be treated thoroughly, the canal thoroughly filled and an X-ray taken. At the end of six or eight months another picture should be taken, and if this picture shows the area getting smaller, all O. K., but if it is the same size or getting larger, the apex should be resected at once or the tooth extracted and the socket curetted. It might be here mentioned that in case

the area does not get smaller, it is probable that the root end has been denuded.

c. When a tooth has more than one-third of its root involved it should be extracted and the socket curetted—no matter what the condition of the root canal or root filling.

Class II is made up of teeth having incompletely filled root canals in which the X-ray picture does *not* show any canal farther than the root canal filling.

Subdivision a, a very small area.

Subdivision b, an area less than one-third of root.

Subdivision c, an area more than one-third of the root.

a. The X-ray should be verified by removal of canal filling and by an attempt being made to get nearer the apex. If not successful on account of obliteration of the canal, then fill as far as possible. Keep a check on this tooth every year—by the X-ray—and if the size of the area remains the same, O. K., but if it gets larger root resection or extraction and curettement is indicated. The area is taken to be a thickened pericemental membrane due to previous irritation or abnormality of the apical foramen.

b. Either root resection and sealing of apex or else extraction and curettement is indicated.

c. As in Class I, subdivision c, the tooth should be extracted and the socket curetted.

Class III is made up of teeth with completely and perfectly filled root canals, and as before—

Subdivision a, a very small area.

Subdivision b, area less than one-third of root.

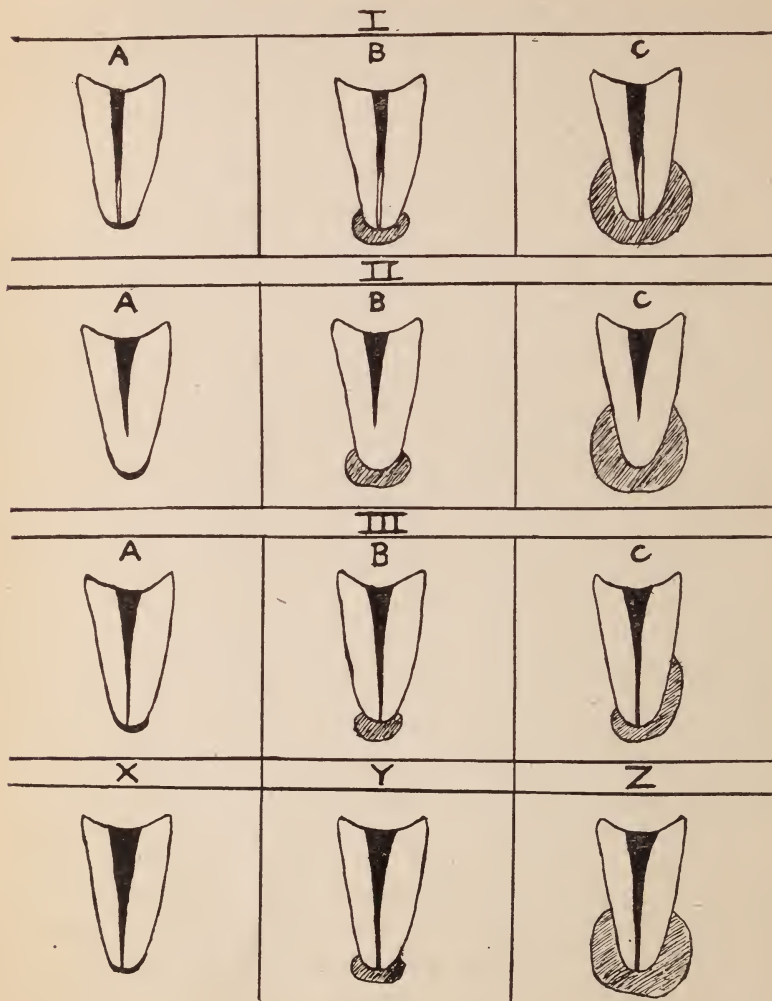
Subdivision c, area more than one-third of root.

It might be well right here to impress upon you the fact, that a canal point may reach as far as the apex and yet not perfectly fill the root canal. In such an instance the tooth should be placed in Class I, only stated a little differently, as follows: teeth having canal points reaching to apex, but with canal showing alongside of the canal point. No such tooth should remain in the mouth without being re-treated and refilled.

Now, subdivision a of Class III. If canal filling is perfect leave this tooth alone, but check up on it every year with the X-ray and the instant the area starts to get larger, re-treat or resect apex, or

extract and curette. The area is taken to be only a thickened pericemental membrane due to the irritation of the canal filling.

b. Should be left six months and then another X-ray taken,



and if the area is getting smaller, O. K., but if it remains same size, or gets larger, either resect apex or extract and curette.

c. As in Classes I and II, subdivision c, such a tooth should be extracted and the socket curetted, because where more than

one-third of the bony periapical support of a tooth is lost, that tooth can rarely be made serviceable.

The foregoing classification has been in regard to the root canal filling. Here we will briefly classify the same condition in regard to the size of the area at the apex—of course presuming that, in the absence of clinical symptoms of disease, an X-ray check up is kept on all pulpless teeth at least once a year, and presuming that all the teeth have been treated thoroughly and the canals filled as completely and perfectly as possible.

Class x. A very small shallow shadow indicating possibly only a thickening of the pericemental membrane from irritation—such a tooth should be left alone as long as the shadow remains the same size and gets no larger. The instant it starts to enlarge, either root resection or extraction and curettement is indicated. Class x may have a sinus and that be the reason the area is small, and we would presume that the sinus healed before we would consider it safe to remain with the area the same size. It is also well in this case to have pictures taken at different angles, as the area in reality may be larger but hidden by the shadow of the root itself.

Class y. A larger area but not involving more than one-third of the root end. If the shadow does not decrease in size in six or eight months, such a tooth should have a root resection, or extract and curette.

Class z. An area larger than one-third of root end means extraction and curettement in all cases.

The above classifications apply to single rooted teeth, but the same principles apply to multirooted teeth. Each root is considered as a single rooted tooth as far as treatment or apical resection is concerned, and if the indications for extraction of a single rooted tooth are present in one root of a multirooted tooth, as a rule the whole tooth should be extracted. In some cases, however, it may be advisable to resect one root completely instead of extraction, and in such a case the part of the crown over that root should also be sacrificed to prevent the formation of a pocket or shelf under the gum for secretions to collect in and to become infected.

In regard to root resection, it is my opinion that any periapical infection can be completely eliminated by such an opera-

tion. Of course, the area around the resected root is not normal, but it is healthy, being composed of scar tissue. Such a condition is undoubtedly an area of lowered resistance, but whether or not this area becomes reinfected can be determined by a yearly or bi-yearly check-up with the X-ray. At the first suggestion of an area of bone absorption occurring, the tooth should certainly be extracted.

In pyorrhea teeth, if the rarefied area extends one-third of way along the root, it can be successfully scaled and kept healthy. If the same area extends farther than one-third and up to one-half to two-thirds of the length of the root, the tooth can hardly be kept healthy unless the gum is cut away, exposing the root, and thus allowing perfect drainage for all secretions. If the same area extends farther than two-thirds of the way along the root, such a tooth can rarely remain in the mouth both useful and healthy and therefore should be extracted. Extraction is also indicated in multirooted teeth where the bone has been absorbed in the bifurcation or trifurcation.

All of the foregoing presumes the patient to be in perfect health and not suffering from any of those disease recognized as being caused by focal infections. In case the patient is thus suffering, all other foci have been eliminated, and the patient has no tendency to get well, no temporizing should be permitted, but all teeth with areas at the apex should either be extracted and curetted or the roots resected, in order to obliterate all possibility of infection therefrom. If the patient still has no tendency to get well, possibly every pulpless tooth should have a root resection or extraction, because there have been a few instances where the removal of apparently healthy pulpless teeth has been immediately followed by cure of the patient.

In conclusion I would say that, valuable as a dentist does and should consider each tooth to be, yet he should never hesitate to sacrifice one, or even all of them, where the health of the patient might be jeopardized by their retention.

THE DISASTROUS RESULTS OF NEGLECT OF ORAL HYGIENE.*

BY C. H. OAKMAN, M.D., D.D.S., DETROIT, MICH.

It is my purpose to show a slide or two of the various diseases or conditions which are caused by neglect of the teeth and mouth, and to drive home the necessity for early dental examination, instruction and care of the children in the public schools.

Many of the following conditions which will be thrown on the screen would have been eliminated had they received early dental care.

No one in this day is capable of making complete examination and diagnosis by clinical evidence alone without the use of the X-ray, and many times not then, until several radiographs have been taken. I believe the profession has made a great error in allowing the patient to leave after one radiograph is taken, as if it were infallible. If illness is suspected as due to teeth conditions, many radiographs should be taken and at intervals. The rays should be studied and re-studied until there is little danger of neglecting anything. While I realize the great necessity of the X-ray, the clinical evidence must be an important factor in some cases, even disregarding the findings of the radiograph.

Irritation about the teeth and mouth should be observed at the earliest moment and corrected. While the etiology of cancer is not known, we have substantial evidence that irritation is a causative factor in some cases, at least, and in order to cure same, early discovery and operation is imperative.

I believe that the time is not far distant when every person having dental operations done will seek the benefit in diagnosis to be derived from the X-ray. We know that many persons suffer from the effects of unerrupted and impacted teeth; also infections and blind abscesses at root ends. After years the condition is discovered and many remark, "Why did not some one advise me sooner the value of the X-ray?"

The value of the X-ray in diagnosis should be taught in the public schools to some extent at least, so that when the time

*Presented before the Chicago Dental Society, April 16, 1918.

comes for the children to have dentistry done, they will have some knowledge of the necessity for proper dental care, especially in root fillings. Also that they may know the danger in neglect of the teeth and mouth.

We must recognize the fact that it is to the children we must look for the progress in oral hygiene, which means prevention of the various infections due to the neglect of this subject. The vast progress which has been made in oral hygiene with school children will, I believe, appear small when compared to the vast amount of work that will have been accomplished during the next decade. When we consider the great dental infirmary given to Boston by the Forsyth Brothers and the Rochester Dental Infirmary donated by Mr. George Eastman, and supported by several philanthropic citizens, it is evidence that the work is bound to bring others to a realization of the great necessity for this work.

Doctor Charles Mayo, the noted surgeon, said, "People will not die of plagues as in time past, but will die of simple infections originating above the collar." This is a strong statement from one who has given this subject great consideration, and whose statements are unchallenged. The more one comes in contact with the treatment of focal infections of the teeth and jaws, the more the above statement appeals to him.

Many of the conditions represented in these slides, I am sorry to say, are caused by failure to secure proper advice through consultation at an early period. Some dentists say that they never had a patient die while under their care. In many cases, it might be better if the patient had died, than to be badly disfigured or maimed for life through eleventh hour surgery.

In taking up a subject of this nature in one paper, I can point out only a few of the multitude of cases. Volumes will be written and articles compiled on this subject as soon as the physicians and dentists come to a full realization of the ravages caused by focal infection among the human family. I will not enumerate the conditions that are the sequel of focal infections, as they are well known, but will urge, in closing my preface, that more consideration be given this subject by the average practitioner in dentistry, for, by so doing, he will be able to teach the people at large, as well as the physician. It is the dentist's

work, and he should be qualified, and in return he will reap the reward in having benefited mankind.

*A. Slide one represents a partial dumb-bell shaped, lower bicuspid with rarefied area. This was a streptococcus infection, the same as that which caused an osteomyelitis on the opposite side of the mandible, resulting in resection of this half of mandible.

B. Slide two represents a case in which nearly all the upper teeth were infected or indirectly involved by a pneumococcus infection. The patient, a young woman about thirty-five years old, had headaches for about eighteen years, and never was well. After the removal of the teeth and a radical operation performed on both antra, a marked improvement was noticed. Six injections of autogenous vaccine were used, and inside of six weeks, she was free from pain, and is now in the best of health, gaining much weight. It is now eighteen months since operation.

C. Mr. H. had complained of pain in the top of his head for more than two years. He would place his finger near the center of the crown and point out the area involved. This condition became so annoying that the patient remained awake at night, and was in a very nervous condition. He stated that the area mentioned was always troublesome. He had been treated by the best internists with only temporary relief, and only while under treatment. The X-ray showed that the lower, left, second molar had the distal root amputated. This area was filled in by an infected granulomatous mass; also diseased bone, which was removed. This extended to the inferior dental nerve. It seemed, for a time, that the source of infection had been eliminated. A radiograph of the second molar on the opposite jaw showed and infected area at the bifurcation. This blind abscess was of large size. Note the resorption at root end. This condition was much worse than the radiograph showed. After the removal of the tooth and curetting socket, maintaining of drainage, combined with autogenous and stock vaccines, the patient was relieved of all his pain. He proved a grateful patient.

D. Mrs. F., aged thirty-five years, had been an invalid for five years and was a great sufferer. She was confined to her

*These slides were previously shown before the National Dental Association, and will appear in the *Journal* of the Association.

bed and was unable to stand or walk alone. A complete, fibrous ankylosis of the jaws was present during the whole period. She was able to take only liquid or semi-liquid food. These radiographs show that the vertebrae were practically united in two places. When seated, her right leg remained at right angles with her body and could not be lowered; even slight pressure upward or downward on the leg would cause severe pain. Radiographs (films) could not be taken until her jaws were opened. Nitrous oxid and oxygen were administered and the jaws separated. After three attempts, the jaws were opened and rays taken. A lower, right, second molar showed an abscess at root end. Later, the left antrum was found to be infected. A radical operation was performed, as the condition was of long standing. The antrum was filled with ploypoid tissue. The infection proved to be streptococcus. The patient never experienced any pain or inconvenience from her teeth previous to operation. A year ago, she was able to eat corn from the cob, while heretofore, as previously stated, only liquid or semi-liquid food could be taken. She was greatly reduced in weight. Later, she ate every two hours and gained considerable in weight. I feared that the great consumption of food would upset her metabolism, but contrary to my apprehensions, her elimination remained perfect. Her facial expression, which formerly showed great suffering, had now changed to one of happiness. She is now able to sit with her heels together, and walk about the house and do part of her work. The position of her right arm shows a marked improvement. Her hands had been stiff, with joints swollen, and she could not bear to shake hands. Now, her hands are quite supple, and she can play on the piano and reach an octave with ease. Her body is still bent, but on account of the hip condition clearing up, it was hoped that the spinal condition could be helped. An operation on the spine may help her. Heretofore, she had taken morphin and other narcotics in large quantities. She has not taken any for a year.

Case D—After two months' operation.

Case D-1—Note improvement in right arm.

Case D-2—Partial ankylosis of spine.

Case D-3—Note roughness at the head of femur.

Case D-4—Photo taken one year before onset of illness.

E. Mrs. S——, age thirty-eight years, had been confined to her home almost continuously for two years with multiple arthritis. Her knees and ankles were greatly enlarged and she was scarcely able to lift her feet from the floor. Her foot movements were of a sliding motion. All of her molars and bicuspid were crowned and bridged. The patient was unable to give any previous history of teeth condition before crowns were placed. She complained of being continually cold and chilly. Even in bed, she was cold and unable to sleep. She used two grains of morphin and sixty grains of aspirin daily. She continued this for months. Her normal weight was 135 pounds, and she was reduced to 82 pounds. An electric pad was prescribed for her bed, about 18 by 12 inches. She could regulate the heat readily, and this gave her much comfort and enabled her to sleep better. The radiographs showed several teeth to be infected at their apices. Several teeth were extracted and sockets curetted. Slight improvement was noticed, but this did not cure her. The third molar, which appeared in good condition, was, I believe, the chief offender, for, after extraction and obtaining an autogenous vaccine from the pus of this blind abscess area, a great change took place, and she was able to walk with comfort, although not immediately. She had been attending to her work every day for over a year, and her walk is quite normal. A slight swelling of the back of the hand is the only evidence left of her former condition.

F. Mrs. R. Antral empyema, due to diseased condition at the apices of molar roots. A large septum divided the antrum. Necrotic bone and part of the floor of orbit removed through external incision. This was done without injury to infraorbital nerve. This case was previously diagnosed as erysipelas.

G. Mr. ———. These four teeth were found in a bilateral antral case, together with several tooth germs which were lost at operation. Note the abnormal size of two of the molars covered with ceruminous calculus.

H. Mrs. C., for a number of years, was never well; always complaining of being below par. There was evidence of septic absorption. The radiograph showed infected area at apex of root of upper second bicuspid. On extraction of tooth, the condition of abscess was much worse than the ray showed it to be. Marked

improvement came inside of two weeks. She is now very well. This is one case in hundreds.

I. Mrs. S. This represents a case of tuberculosis of the lower jaw. She had undergone two operations by a general surgeon while in Chicago, but the disease recurred. A more radical operation was done, and she is now in good health. She has since given birth to a child, who is now three years old. Mother and child are in the best of health. 2. Partial resection of the inferior dental nerve.

J. Mr. M., age fifty-five years, was employed at a match factory seven years ago. He is now a watchman. Necrosis of the upper jaw involving both antra existed, and three-fourths of the palate and the superior maxillary from the molar process to nose were infected. In fact, all parts were found to be necrotic. The nose on either side was included. The long lapse of time since his employment in the match factory would make the question of phosphorous necrosis rather remote. On examination, the whole upper jaw appeared to be a rotten mass. I did not care to give a profound anaesthetic, for fear of setting up a septic pneumonia. The circulation was practically cut off. In three sittings the palatal bone and soft tissues were removed, except a portion a short distance from the junction of hard and soft palate. Both antra were a putrid mass, and the outer plate of bone necrotic on either side of the face from molar process to nose, which was removed without an anaesthetic, local or general. The parts were so diseased that the operations were done without inconvenience to the patient as far as pain was concerned. He had a marked cachexia, in six weeks, the patient's color began to improve. An appliance was fitted to the jaw, as we were able to retain two loose molars for which we had little hope. Had the teeth been lost, it would have been quite impossible to place an obturator for a long time. Teeth are quite firm and phonation is better than any time in seven years. The rapid progress made by the patient was largely due, I believe, to absence of an anaesthetic. He has gained much in weight, and attends to his work every day. The prognosis was grave in this case.

K. Mrs. S——, age sixty-two years, complained of pain in the region of the upper, left, second molar, which was loose.

Tooth was removed and face continued to swell and adjacent teeth became loose. Pathological examination of tissue showed it to be a carcinoma. On account of the very rapid progress of the disease, an operation for resection of the upper left jaw was contra-indicated. The patient lived four months. I believe, however, that an operation would have made his end much easier. Although a man of education and refinement, he gave his teeth practically no care.

L. Master J., age sixteen years. While visiting a dental school clinic, it was found that he had a suspicious growth which bled easily. The part involved was removed, which comprised the process. A pathological examination showed it to be a small, round-cell sarcoma, which is the most malignant type of sarcoma. A recurrence appeared several months later. The molars and bicusps were extracted and the bone removed from the angle of the jaw to the cusps without disturbing the inferior nerve. He has had two treatments of radium, and the parts look well. Operated three months ago. The prognosis in this case is grave.

L-1. Little-girl, age eleven years. This case was discovered by a dental inspector in one of the Detroit schools. You will note that the child has a cleft palate. She was sent to the writer for operation. On examination, it was found that the nasal septum had disappeared. It was then quite evident that it was not a case of congenital, cleft palate, but very likely one of syphilis. A positive Wassermann was obtained.

We are very anxious to know the source of infection, so procured a Wassermann of each of the parents, which proved to be negative. This little girl was the third child in a family of four. All the children were rugged and healthy, having none of the landmarks of luetic taint, and the parents were robust and hard-working people. The child attended school part of the time during her illness. Just when the initial lesion appeared is not known, but it is fair to presume that it was at least two years previous to the discovery of her condition. It was believed that she contracted the disease from drinking cups or from all-day suckers, which are often passed from one child to another. This disease is also known to have been contracted from eating utensils and by kissing of babies as well as children and adults. It is still a mystery how this child could attend school much of the

time; being in close touch with the teacher, it was very strange her condition was not observed sooner. When we think of all the danger to which the children in her room were subjected, we will realize the advisability of individual inspection of school children by medical men as well as the dentist. It is not the fault of the school physician alone that conditions like the above are allowed to exist two years without being discovered, but it is the system which is at fault, and we cannot hope for efficient medical inspection until the individual is first considered.

The aforementioned history, together with the histories of many other cases, some of which were found at an early period, followed by early operations, have been the means of saving the lives of many children from the effects of sarcomata. Even the most malignant types have been discovered among children—that of small, round-celled sarcoma.

L-11. Miss V., age seventeen years, had an abscess in the region of the lower left molars. Eventually, this blind abscess burrowed its way to the outside of the face, following the chain of cervical lymphatics to the clavical, when it again broke through the skin. The left axillary space also showed evidence of the infection; also on two phalanges of the great fingers. Both molars were removed and diseased bone curetted. It was found necessary to open from the cheek surface in order to remove infected tissue. She had been fully aware of her condition for months, but failed to obtain treatment.

M. Girl, age fourteen years. A Russian who had been in this country only six weeks when she had a lower molar extracted. This wound did not heal, and the case was then referred to the writer. A pathological examination showed it to be a small, round-celled sarcoma. The process was so rapid that the whole mandible had to be removed at the articulations. The bone was so disintegrated that it was removed in small particles. Knowing that the child could live but a short time, an external incision was deemed best, which extended from one angle of the jaw to the other. She died three months after the tooth was extracted. Note the inferior dental nerve in lower part of the picture.

N. Rev. S., Canada, had been troubled with a case of corneal ulcer for many months. His oculist was not meeting with any

success in its treatment. The case was referred to the writer, who discovered through radiographs that several of the teeth showed evidence of infection about the apices, together with a case of antral empyema. The several teeth were extracted and the antrum drained. Inside of a week, a marked improvement was apparent. I have not seen patient in six months. Note resorption at apices of roots.

O. Mr. G., age forty-two years, was of a neurotic type bordering on melancholy. He had a marked tendency to blink his eyes. This X-ray shows two unerrupted cuspid teeth. The left one was removed in November, 1917, which required the amputation of central and lateral incisors roots which were diseased. These teeth were pulpless and the cuspid was firmly imbedded with apex nearly in antrum. The vision of the left eye has improved since operation. Just to what extent, we do not know, as the oculist has not yet examined him. The other cuspid is yet to be removed.

P. Mr. ———, from a town in Ohio, was being treated by his oculist for a very aggravated case of scleritis in both eyes. This caused him pain and inconvenience for many months. A radiograph was taken of all his teeth, but only a lower second bicuspid showed evidence of any trouble. A blind abscess developed about the root of this tooth several months previously. Tooth had been treated for some time, when the dentist filled the root and was about to cement the crown on the root. I advised extraction of the tooth, which he consented to after some persuasion, as he thought the tooth in healthy condition. Two days later, he returned home when his condition began to improve. Two weeks later, he returned, when it was found that his eyes had entirely cleared up.

Q. Mr. G. M., Chinese, age twenty years. A dentist attempted to extract a lower left molar, but removed only the crown of the tooth. A streptococcus infection followed, which was of a virulent type. The outer plate of the jaw was removed, together with the inferior dental nerve. Three days later, the infection crossed the median line, and continued its course until it had reached the parotid gland and involved the area of articulation. The same operation was performed as on the other side. Temperature 104, pulse 130 followed the second operation. This

continued for four days, when it was determined to resect the whole mandible, and it was believed it was his only chance. Temperature 105, pulse 140. His recovery was slow, and it was months before he began to make much progress.

This cut was taken eleven months after operation; showing a vast change in this period.

R. Mrs. B——, age thirty-eight years. Pyorrhea had been treated for eight months. Condition continued to grow steadily worse. The case was referred to the writer, who immediately had the case rayed. This showed a large, infected area with resorption of part of distal root. Tooth was extracted and a large abscess removed. Patient had complained of stiffness in the muscles and knees during pyorrhoeal treatment. Her condition improved rapidly.

Miss H. S——, aged sixty-three years, occupation school teacher. She had been in poor health for several years. Since her illness, she lost two sisters by death, and it was feared for a time that she would not long survive them. She had been under a physician's care, but was not improving. Her niece, who had had a focal infection about the teeth and jaws, called on the writer and gave him the above information. It was left to him to advise what to do. X-rays were suggested and accepted, and the slide shows one of the conditions found. An infected granuloma was removed from above the first and second molar teeth. The bone was involved, but the infection did not enter the antrum, the membrane of the antrum being the only barrier. The eradication of the condition soon began to show in the patient's health. She had gained in weight and endurance. She is now in good health. Stock vaccines were used while autogenous vaccines were being prepared. The results obtained in this case were most gratifying

U. This picture shows the result of poultices applied to the face when pus was present at the roots of the teeth, so often advised by kind neighbors. Sorry to say that the practice among dentists and physicians, although less than formerly, is still in vogue.

V. Syphilis. This case was sent to the writer for treatment of an infection of the gum in the region of the lower teeth. It proved to be a case of syphilis, bilateral chancre (somewhat

unusual). Note extension of infection to opposing surface of upper lip.

W. Mr. ———. Antral empyema of long standing. The patient complained of catarrh for years. All so-called cases of nasal catarrh should be observed for antral infection. Many of these cases are not diagnosed until too late, when they are found in conjunction with pan-sinusitis or necrosis or both.

X. Mary S., age five years, had suffered a great deal from alveolar abscess in the region of the lower right molars, resulting in necrosis of the jaw. Drainage was maintained for some time, when exfoliation began to take place. It is hoped, through this procedure, that there might be enough osteoblasts deposited to maintain the contour of the face; to some extent at least. I had hoped to save part of the jaw, but my efforts were of no avail. The jaw was removed intraorally from the median line to the articulation. When the child had pain, hot poultices were applied to the jaw. This, of course, aided the propagation of bacteria. Hence, the disastrous results. She was operated two months ago, and made a rapid recovery.

Y. Mrs. T. C., age forty-five years, had undergone an operation for a pan-hysterectomy, after which she was unable to walk without crutches or a cane for three months. Her right knee was much enlarged and ankylosed. She was sent to the writer by her physicians for a diagnosis regarding her teeth and mouth conditions. Clinical examination showed that she had marked pyorrhoea. Several X-rays were taken of the teeth and jaws, which showed but one rarefied area at the apex of the upper right cuspid. The pyorrhoea was treated successfully, but there was no change in her general condition. The cuspid root was excised and area curetted. Seven autogenous vaccines were used, together with a couple of stock vaccines, but no improvement was noted. She began to show melancholy symptoms, and feared that she would never be able to walk. Her right knee was greatly enlarged. I feared that her condition might never be better. While treating her, I recalled that I had had a patient who had marked mental depression due to absorption from a focal infection about the teeth. It occurred to me to try this patient's vaccine. I assured the patient that if this strain of bacteria did not cure her, I would have to send her back to her physician. Five

days after second injection, she had put away her crutches and was able to walk with the aid of a cane. Five days after the third injection, she came to the office showing marked improvement. Five days after the fourth injection, she came to the office without a cane. The knee was then given passive motion, and the creak of the joint could be heard almost in the adjoining room. It is nearly two years since she was discharged as cured, and there has been no evidence of the former trouble, and she is in good health.

Z. Mrs. B——, age forty-five years, had been a sufferer due to multiple arthritis, for a period of twelve years. She was very anemic and had a pasty complexion. Her knees, ankles, feet shoulders, hands and neck were all involved. It was with the greatest difficulty that she was able to walk or even move. It was necessary for her to take large doses of narcotics. Her radiographs showed two rarefied areas about the molar teeth, which were extracted and area treated. Only a slight improvement was observed. Her progress was slow until she had operations on both antra, after which her improvement was very rapid.

When riding in an automobile over paved streets, it was necessary to drive slowly, for any little depression in the pavement would jar her body; especially her neck, and she would cry out with pain. Last fall, after six months' treatment, she was able to make a round trip in an automobile to her summer home, which was a distance of thirty miles over roads having their share of "bumps." The trip did not inconvenience her in the least. Her walk is now practically normal, and she stated that she has no further desire for drugs. She now appears very happy (a big contrast to her former condition). She explained that she is now enjoying life and making up for lost time. She had used large amounts of aspirin and morphine. She had not used drugs in several months. She walks very well, and is able to place her hat-pins in her hat without any difficulty.

Case Z-1. Mary L——, age five years, had developed a blind abscess at roots of a molar. This condition existed for months. The family physician was the offender in this case, by advising poulticing of the face, which was done religiously. After the periosteum was raised from the bone, the infection made rapid progress. The molars were removed and the wound curetted. It was

found that the disease extended through the body of the bone, and about an inch of the bone was resected. This was done intra-orally, but did not improve her condition to any extent. More diseased bone was removed from the mesial and distal ends of the wound, but this did not improve her condition. Drainage was maintained for some time with the hope that osteoblasts would be cast into the area sufficient to maintain part of the contour of the face at least. The ravages of the infection were progressive, and it was found necessary to resect the jaw from the articulation to the median line.

REPORT OF COMMITTEE ON ART AND INVENTION.*

BY DR. F. L. MILLER, LONDON MILLS, ILL.

To the Members of the Illinois State Dental Society:

Due to the abnormal conditions existing in our country to-day as a result of the war, the number of new productions and inventions is very limited. Especially is this shortage noticeable along the line of high grade steel instruments. A number of manufacturers who in previous years have reported quite a list of new articles, this year inform me that they have produced nothing new at all.

Your committee, however, begs to submit for your approval the following list of productions:

BUFFALO DENTAL MFG. CO., BUFFALO, N. Y.

(1) *The Lewis Box Flask.*

This has been adopted for use by the Dental Corps in the U. S. base hospitals. Is well adapted for splint and other large work which the ordinary flask will not accommodate.

(2) *The Tench Donham Flask.*

Is made expressly to meet the views of the man who practices the muscle trimming method.

(1) *The Precision Flask.* Designed by Dr. Rupert E. Hall of Chicago. Was unable to get any data in regard to same. Distributors not known.

*Read before the Illinois State Dental Society, May, 1918.

ITTER DENTAL MFG. CO., ROCHESTER, N. Y.

(1) *The Ritter Unit Equipment.*

A complete operating equipment within immediate reach of the operator, including engine, cuspidor, bracket table, spray bottle warmers, compressed air appliances, ionizing outfit, and complete set of distributing panel electrical instruments, all within a limited amount of space, yet without the sacrifice of practicability or efficiency.

The Holmes Sterilizer—Patented December, 1917.

Made of aluminum, solid cast box and cover. Raises the tray with the cover. Can be heated by electricity, gas or alcohol. Nothing to melt out if it boils dry. Heater is made like an electric flat-iron—can be readily replaced if damaged.

THE HALVERSON CO., CHICAGO, ILL.

The Master Halverson Sterilizer.

An important feature has been added—the Dry Air Unit, which will sterilize cotton pellets, gutta percha points, broaches, etc. Will warm impression wax, dry inlay investment and instruments.

THE S. S. WHITE MFG. CO.

(1) *The Sibert Buff Changing Chuck.*

A time-saving device for motor or lathe. Is equipped with a milled sleeve which automatically locks the chuck without stopping the lathe or motor.

(2) *S. S. White Detached Post Crown.*

Adapted to the use of the I-bar post and also the round post.

(3) *A Simplified Die Plate*, designed by L. M. Farnum.

This die plate will be found worthy of your investigation.

(4) *"Onlysafes Sterilizer."*

Is governed by a thermostatic switch which once pushed on becomes automatic, controlling the temperature of the water at either 180° or 212° F. In case it boils dry, the slight abnormal heat automatically cuts off the current, without any damage.

(5) *S. S. White "Natural Base."*

An improved dental rubber. Vulcanizes a beautiful olive green.

(6) *S. S. White New Veneering Rubbers.*

It is claimed that they are much stronger than the old pink rubber.

(7) *S. S. White Thermometer and Holder.*

For attachment to the S. S. White and Mann Vulcanizers.

(8) *S. S. White Silver Cement.*

Claimed to possess special germicidal action.

(9) *S. S. White Belt Engine Arm No. 5.*

Universal and interchangeable.

HARRY J. BOSWORTH CO., CHICAGO, ILL.

(1) *The Bosworth Molten Metal Sterilizer.*

Has special adaptation for novocain dissolvers.

(2) *Simplex Molten Metal Sterilizer.*(3) *The Bosworth Hamper.*(4) *The Bosworth Dressing Table.*

Made in mahogany, ivory and gray finishes, especially designed for small dressing rooms.

(5) *A Number of Pieces of Crystal Glassware.*

The psychological effect of their appearance is their chief merit.

(6) *Bosworth "Aseptic Bracket Table."*

Has Bunsen burner through center of table.

(7) *Bosworth "No Nickel Aseptic Bracket Table."*(8) *Bosworth "Gas and Air Connections and Filter."*

Designed to overcome leaky gas and air troubles.

(9) *"Standard Junior Interruptless Transformer."*

This transformer represents a high type of X-ray machine for dental radiography.

(10) *Columbia Magnifying Radioscope.*

DR. ARTHUR E. SMITH, CHICAGO, ILL.

(1) *Nerve Blocking Syringe.*

Made of metal and glass. This syringe overcomes the disadvantages heretofore experienced. It is free from washers and threads, short, and can be manipulated with one hand.

(2) *Local Anaesthetic Rack, for dissolving cups for preparing injecting solution.*(3) *Intra-osseous Guide.*(4) *Intra-osseous Double Bladed Lancet.*(5) *Intra-osseous Drills.*

These instruments enable the operator to make intra-osseous injections with accuracy and eliminate trauma.

LILLY & CO., INDIANAPOLIS, IND.

Have produced a new preparation which they call "Hemagulen," a physiological hemostatic for local application.

FARBWERKE-HOECHST COMPANY, NEW YORK CITY.

Report they are now producing novocain in this country, identical in every point with the formerly imported novocain, and that they will be in a position to supply the profession as soon as the U. S. Government orders are filled.

PARKE-DAVIS & CO., DETROIT, MICH.

Have within the last year produced a new synthetic local anaesthetic known as "Aposthesine," which is being used by many as a substitute for novocain. The reports in most cases are favorable.

MAKING YOUR MONEY EARN MONEY—SAFELY.

A SERIES OF ARTICLES ON THE CONSERVATION AND INCREASE OF SAVINGS.

BY GEORGE LEE M'CANDLESS, CHICAGO, ILL.

Article VI. Investing for the Account of Others.

It often happens that a man finds it necessary to face the problem of investing funds other than his own savings or funds which were created for the purpose of perpetuating an income for others than himself. Such money may be inherited money coming from deceased friends or relatives, or it may come in the form of insurance money.

Having the trusteeship of such funds imposes an obligation upon the trustee to see to it that all elements of speculation shall not exist in the investment thereof. It should reasonably be expected that such funds be made to yield an income—but only an income consistent with safety. The essential thing is that the principal, or original capital amount, shall remain unimpaired. Any attempt to increase this original capital account, aside from through interest return, is speculation and it should be remembered that the chance of loss will always be proportionate with the chance for gain in all investments.

State laws generally impose restrictions for safeguarding trust funds by limiting the investment of such funds to certain specified securities. However, inherited money frequently comes in the form of investments possessing a speculative element. The fact that such inherited money comes in the form of an invest-

ment already made is no reason for its remaining invested in that particular manner—no matter what the reputation of the benefactor may have been for sagacity. It will seldom be found that an entire estate is absolutely free from poor investments. Every man of means usually does a certain amount of gambling with his money and, though the proportion of his estate left in such form may be small, this proportion will be greater in the case of each parcel left to several beneficiaries. Therefore, the first step taken in handling such inherited means should be to have an analysis of such invested funds made by a responsible authority. In most cases, where such an analysis discloses speculative elements, readjustments or reinvestments may be made to remove them. For the proper working out of such a safeguarding program it only remains to select the proper authority for the analysis of the investment position, and advice as to properly readjusting, of inherited money. The writer has previously hinted that it is only about as hard to find a good bond house—the proper source of such information and advice—as it is to find a good dentist.

When an insurance policy becomes payable, the beneficiary usually has several options as to the manner in which he may receive the money due. He may have a certain sum, spot cash, or he may have various amounts dealt out to him at specified intervals, or he may receive a certain specified income from the money due for a certain length of time. It is natural for the insurance company to prefer all other plans of payment than the first. The longer they may have the use of the money, the more profitable it will be for them. Insurance companies are not philanthropical institutions. It will therefore be found that the beneficiary will ordinarily be better off to take the cash surrender value of his policy, when expired, and invest the proceeds in the same kind of securities to which insurance companies are restricted by law.

Investment bonds should prove the best instrument of protection and producers of income for such funds described in the foregoing. Where the trustee of such funds is not otherwise restricted by law in his selection of such bonds, a safe rule to follow is to restrict such investments to bonds "legal for savings banks" in such states as Massachusetts, New York or Connecticut.

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-FOURTH
ANNUAL MEETING, HELD AT BLOOMING-
TON, MAY 14-17, 1918.

DISCUSSION OF PRESIDENT HINKIN'S ADDRESS.

(This address was published in the June issue.)

VIRGIL P. PERISHO, Streator:

Mr. President, Ladies and Gentlemen:—It is a great honor to be called upon to open the discussion of this most excellent address of our President. The Society is to be congratulated upon having a President of such keen insight into conditions and needs, and the ability to present these to us in such a forceful manner. The only regret that I have, is that the President's address comes so early in the session, when so few are present.

We can readily see from the tone of this essay that the financial situation has been a great worry during his administration, as well as those of the past few years. It has certainly tied the hands of these competent officers, for without funds they must cease work.

You will note in the discussion of President Whipple's address last year at Quincy, Dr. Logan, Dr. Gallie, Dr. Reid, and in fact most all the men who took part in the discussion, suggested and recommended that the Society increase its dues. Dr. Whipple called attention to the great work that was thrust upon the Secretary, and in part said that it was almost a crime to ask a busy man in this day and age, to do all this work, and at the same time have the worry of the finances.

Dr. Hinkins has painted a true picture of conditions, for this has been before the Council many times. I believe, in 1916-17, Dr. Torrence reported to the Council, that in order to supply the necessary funds, he asked his wife to go to the bank in his home city, and sign a note with him for \$1,000.00, in order to carry on the financial obligations of our Illinois State Dental Society. Should we ask this of such a man as Dr. Torrence? This only shows the earnestness of this valuable treasurer.

Our President in his report calls our attention to the fact that \$150.54 was all that was left in the treasury June the 1st,

1917, to carry on the work to January 1st, 1918, and mentioned the many necessary expenses. Is there a man present today, (or at home that is too busy to attend this meeting), that would be willing to carry on this work as Dr. Luthringer and our other officers have been asked to do? I don't believe many would volunteer. Dr. Luthringer deprived himself of the help of the assistant secretary, soon after he accepted the office. The Council had voted that he should have this help, but being a real business man, and knowing the need of economy, he tackled the job alone, and has succeeded in every way, as we all know.

At a meeting of the Council during the Quincy meeting, Dr. Warner, moved that the treasurer be authorized to borrow any necessary funds to carry on the business of the Society. Notes to be signed by the President and Secretary. This was carried. Should we continue business this way?

It has been said that we raised our dues \$1.00 last year. It is true that \$1.00 was asked to be paid with our dues for National Research, but in a number of cases this was money saved by the individual member, as this \$1.00 went direct to the National Research. Many of us had signed pledges or promissory notes for \$1.00 to \$5.00 annually to the National Research, and by paying this \$1.00 our promissory notes could be canceled, and I have been informed by Dr. Price that a great majority have been canceled and returned.

The great trouble in all this financial embarrassment, was brought on by our former organizers, being over-anxious to keep the dues down, and they placed them too low. As has been stated, our by-laws call for \$3.00 and we have only received \$2.50. Is there any organization back home, such as the churches, Y. M. C. A., Masonic, Golf, Elks, and City Club, etc., in which you could secure membership for a full year for \$2.50 or \$3.00? It would cost from \$10.00 to \$100.00 at least. Our dues are too low to compare with other organizations.

I have been Secretary-Treasurer of our component Society for the past eight years, and I find that no one objects to the payment of dues who understands the conditions. Only one objected this year to paying the \$1.00 to the Research. He had not read the State Bulletin last June. I am sure that no one who has read and studied the Bulletin of last March, or has heard our

President's address today will object to a liberal raise in the dues.

Our President mentioned the great work done in other State Societies, such as post graduate courses, and in all cases the dues in these States are much higher than ours. Last year several of our members from the northern part of the State went to the Iowa State Society, instead of going to Quincy to our State meeting. One of the men said to me, that he went to Iowa to a real Dental meeting, and that he understood that we had a poor meeting in our State. I made some remarks to him. The dues in Iowa are \$10.00. Would it be right for this man to object to paying a right amount in our State, so that we could have a real annual meeting?

It was reported at the National meeting in New York last fall that Illinois had a membership of 1,840, New York 1,665, giving Illinois the lead in membership over all other States. Should our State take a subordinate position with this membership?

In the President's essay he mentioned that Illinois had the reputation and brains; this being true we should use our brains, and live up to our reputation. This reputation was well demonstrated last fall, when the invitation was given to the National Association to hold its 1918 meeting in Chicago. All the delegates from the Middle Western States voted unanimously for this meeting to be held in Chicago. I am sure that they will not be disappointed.

Our essayist also suggested that Chicago alternate with the down State cities for our annual meetings. I am quite sure that we would all approve of that.

There are many other valuable points in the President's address, such as our Legislation, Membership, Hospitals, Preparedness League of American Dentists, and the Black Memorial. All these should receive our earnest consideration, but I can only agree with what has already been said.

One point I have personally appreciated. That is in regard to the Life Members and Past Presidents. Last December Dr. Hinkins called a meeting in Chicago of the Ad Interim Committee to decide on the date and place for our annual meeting. Dr. Hinkins invited 12 or 15 of the Past Presidents, Life Members and college professors for special counsel. This was a very

wise move and was of great value and assistance to the Ad Interim Committee. I think we should consider the suggestion that our President has made in regard to using the experience of these members.

I personally hope and want to go on record as saying that a vote should be taken to make a liberal raise in our dues before this session closes.

DR. H. W. McMILLAN (Roseville):

I agree with Dr. Hinkins and with Dr. Perisho in all that they have said, with one exception, and that is where Dr. Hinkins says that the transactions should be furnished at cost. I do not know what the cost of the transaction is, but I would favor leaving the price at \$1.00 for a year or two until we find out.

It appears to me that there are three things we need to do—we need to increase our service, to increase our membership and to increase our dues. To increase our service I would suggest that we do not dispense with the certificates, because they cost only about five cents apiece, but instead of that to restore the certificates and charge for them in some way. In the absence of that I would suggest that the State Society furnish each and every member some souvenir of this kind every year. (Shows a button with this inscription: "To Cure Is the Voice of the Past; to Prevent Is the Divine Whisper of Today.") Each member could be furnished these at a small cost to the Society. That would increase the service. To retrench means to retreat. I would not be in favor of retrenching. I would give all of the service possible.

I would also have membership applications and at the beginning of each year I would have a membership slip put into a copy of the Bulletin so that each member will receive an application for membership slip. From the work of the Membership Committee we find there are just about as many dentists who are not members of the Illinois State Dental Society as are members. It is impossible to put this work all on the Chairman and on the District Superintendents; it must be done locally. Dr. Hinkins says we will have about 2,000 dentists. That will be true if none of the old ones lapse. We have gained something like three hundred eighteen, but May 1st, from the list of the DENTAL REVIEW there were dropped for non-payment of dues

413, making the loss this year about 95—even although our Membership Committee have been continuously on the job. We sent out a good many letters but we got as a response, silence, no more response than an Alaskan cemetery. Our Membership Committee is handicapped by lack of response; the District Superintendents are handicapped by lack of response to their queries, so we must find where our weak points are, find out from these non-members why they do not join the Society, and then we want to make it worth while to join.

We have received a report from each District Superintendent except one—District 5—and it might be interesting to give you a little synopsis.

	Men Practising.	Members.	Non Members.	Eligible.
District 1	220	123	95	77
District 2	288	140	142	30
District 3	138	94	44	33
District 4	174	104	70	63
District 6	301	156	145	104
	<hr/> 1,121	<hr/> 617	<hr/> 419	<hr/> 297

We have 207 ineligible. Chicago reports 2,314 men practicing, 1,257 members, 1,063 non-members, 763 eligibles, 300 ineligible; this makes 501 ineligible in the State and a total of 1,060 who are eligible. If we could get these that would be a great help to us. Of course this is an incomplete report and will have to be corrected.

Now in regard to increasing the dues. The National Association receives \$3.00, including the membership fee and the JOURNAL, and the contribution to the National Research Institute. According to the by-laws of the State Society we should receive three dollars. My notion about these local societies is that we should have smaller societies in the State and that they should be more like Dental clubs; they should meet oftener, they should eat together oftener, and there should be less formality. In our Warren County Society we have only one eligible man not a member and one that we consider ineligible. The local county society is the same way. It seems to me that we should get to-

gether oftener in smaller societies—I believe that would be an improvement.

I have taken more of your time than I intended to but I wanted to get this plainly before you.

DR. W. A. HOOVER (Gibson City):

In these times of giving we have heard a great deal about giving until it hurts. I think this is the first instance I have known of any body or any organization that has given until it hurts. We have done that I think. I am not criticizing the giving; it has been for a worthy cause. That is the reason we are financially where we are, and being where we are the question is what is best to do? Dr. McMillan's statistics show us that we have already lost some members—more members than we have gained in the membership drive. What is the reason we are losing? There must be a reason. If it is because of the membership fee, would it be desirable to raise it? Whatever is best for the Society is the thing we want to do. They have put the proposition up to us but have not told us what the trouble is. We cannot prescribe a remedy until we have a diagnosis of the case.

Dr. McMillan said he failed to get answers to his queries in regard to the excuses put up by non-members for not joining. I have been soliciting members and I will give you the benefit of my experience. The men who have at some time belonged to the association and have attended but do not attend today put up for one excuse that there are too many men in the State Societies who like to hear the sound of their own voices and talk when they have nothing to say, and they do not think it is worth while to go. I am just telling you their opinion. Another reason is given that I think is legitimate, and that is that we are over-organized. By the time a man goes to the State Society and the National Society and the Chicago meeting and then gives a day to his office once a month the month is gone.

DR. C. E. BENTLEY (Chicago):

The discussion of this phase of the condition of the Illinois State Dental Society by the President and by those who have followed is of intense interest to me for a good many reasons. I have listened to the gentlemen who have discussed the President's address and particularly those who have been concerned

in the membership drive, and I am convinced that we are only scratching the surface of the cause of our pathetic condition, as it has been outlined by the President. I am not offering a mushroom opinion, because I have been thinking, seriously, and in some instances conferring with men who are particularly interested in the traditions and the future of this organization. I have something to offer this morning—and the reason I am speaking is that those who follow may discuss what I have to offer in the way of a constructive resolution. I am not offering any criticism, but nothing that we have heard strikes at the root of the cause unless it be what Dr. McMillan said—that service is one of the necessary things for the continued and sustained interest of our members. I purpose to talk very plainly as to what is necessary to eradicate some of the evils of which we have been talking and complaining.

The Illinois State Dental Society, frankly speaking, is living today upon its past achievements. It has been glorified throughout the country as being the one great organization that takes the lead in everything and its membership is studded with illustrious names that have glorified and dignified the profession. It is the largest State Dental Society in the country and its contributions to the literature and the welfare and onward march of dentistry cannot be gainsaid, but yet what are we doing? Is it not a fact that we are conducting our meetings today and our clinics and the whole machinery of this organization just as we did twenty-five or thirty years ago? We have not caught that spirit of progress that has carried other societies on—they are not complaining of lack of membership or of lack of funds to run their organizations. What is the trouble? Is it inertia? Is it over-complacency, and are we simply resting upon what we have done? We as diagnosticians and co-workers for the benefit of this organization must look into the case and it is for that purpose that I desire to address myself to you.

When we commence to study our organization in a comparative way with such organizations as those of Oklahoma, Ohio, Indiana, Michigan and Iowa, we will find it significant that these five organizations have stepped out from the old beaten path and have done something that will intensely, continuously interest the rank and file of their membership during the year.

They do not complain of lack of membership or lack of funds, and while I do not believe that their methods would be adaptable to our needs, yet I do think that a survey of all of the things that they have done would enable us to apply them in some degree with considerable profit.

Now whenever you commence to talk about alternating our meetings, as was suggested by the President, meeting in Chicago one year and then going to Peoria or to Springfield—with all due deference to the President I must take issue with him on that for I think that he is treating symptoms rather than the disease. You must get at the cause. We go to Chicago and they have a tremendous group and men get a smattering of what is going on over here or over there, but the sum total of what they acquire is only a mere segment of the circle and it does not amount to very much. And then, too, at Chicago the men run off to moving pictures or golf clubs, or what not, and so the whole meeting, as far as its contribution to the society is concerned, goes by default. I am not so enthused over big meetings as I am over the equalization of things, so that the members in all units of our organization may acquire knowledge and be able to apply it.

Now, we all know that there is a new era in dentistry. There is a great change in our teaching, the teachings of yesterday have been swept from the shelves and where there were one hundred books on one particular subject, now one book has taken its place and it is the authority. So the profession is rapidly changing. The requirements and the responsibilities that are imposed are more insistent today than ever before and the men like myself who have been in the ranks a long time find themselves trudging and trudging to keep up because of these requirements. Your patients are demanding this and demanding that, and what are we doing as an organization to meet the requirements? Hence I say, gentlemen, that we must vitalize this organization, we must put new blood into it, we must change our methods along the line of service to these units, and that will require considerable thought. Now I think, as others have thought, that we must have some set thing that can be considered. It will demand a great deal of deliberation and a good deal of constructive thought and some expert testimony, but in

the end I think we could do no better than to have a committee appointed from the Society with the idea of studying the proposed plans and the needs of this organization and report, possibly to the Council or to the Ad Interim Committee, in a concrete way, perhaps at our next annual meeting.

But in conclusion I want to say to you, that all of these little things I have been speaking of are not the real cause; the cause lies deeper and it is for us who are interested to find out the cause and then to apply the remedy.

DR. D. M. GALLIE (Chicago):

I want to compliment the President on his wisdom in selecting as his message this year a question that should be of vital interest to every one present—the question of how best to conduct this organization so that the greatest number will be benefited by it and in some way provide a means by which we can get the very best out of it. There is no question but that there is something wrong at the present time with the Illinois State Dental Society. I think one reason is that we have been so self-satisfied. They told us that we were the greatest Society in the world and we were foolish enough to believe it, and we have been leaning on that reputation. The sooner we get that out of our minds the better. I have attended a number of the other State societies and I have always come back and told my colleagues that we were not keeping pace with those new societies. But we must not be discouraged. The report of Dr. McMillan—and, by the way, I desire to compliment him on his report—shows that we have over 60 per cent of the total dentists in the State and what is true of Illinois is true of the whole country. I have inquired from different organizations throughout the country as to the organized representative body of different commercial associations, financial associations, industrial bodies, trade Unions, and the organizations that we have always looked upon as perfect, as for instance the American Medical Association, and I find that the National Dental Association has a larger percentage of the total dentists of the country in its ranks than any other organized body in this country. So we are doing a great work throughout the country, and we have a large percentage of the dentists in our National Society and the same is true of the Illinois Society, but they do not attend

the State meetings. What good is it to have 2,000 members if we only have about 400 at the State meetings? We must devise some way that will bring our members to the meeting—at least 50 per cent of our society. I am sure if Dr. Bentley's suggestion is put into effect that some means will be provided by which this society will take its place again among the foremost dental organizations.

I cannot allow to go unquestioned the statement made by Dr. Hoover that we have been giving until it hurts. I cannot understand that, for combining all of these, the local society, the district society, the State society and the National organization, while we have done very well, still we have not given until it hurts. If other societies can stand \$10.00 a year and Oklahoma can stand \$31.00 a year, surely this society can afford to raise its dues without fear of losing our membership. There is no class of men in the country today that is as well off as the members of the dental profession. We are not giving any proportion of what we make. We are better off than tradesmen because we know at this time that a great number of businesses are being ruined, and we are not affected at all. We are going on in the same old way; we are called upon to make contributions for this little thing or that thing, and we squeal when we have to give; but I tell you, gentlemen, we do not know what giving means. You must go to some other place outside of the United States of America to understand what giving means. We have not given as we should at this time, and it is up to us to do more and give more, and we have a very good opportunity in the Illinois State Dental Society.

DR. J. G. REID (Chicago):

I have listened for thirty-seven years to the discussion of why we are failing and why we have advanced and we are today just about where we were thirty-seven years ago—relatively. We have advanced in many ways and this has been largely because the profession has advanced. We have more men in it than we had thirty-seven years ago. We are not losing anything and as Dr. Gallie has said, we are gaining all of the time. Our dues do not amount to the snap of your finger. I do not think it is a question of dues that is bothering this society at all. We could very well advance our dues to \$5.00 a membership or more and

there would not be such a terrible amount of grumbling about it. I do not think that is it. But I believe Dr. Bentley touched the keynote of the proposition when he said it is a question of service—it is a question of what we are going to give the dentists of this State, whether we can make this meeting so interesting that they cannot stay away from it. You must give them something, but you will have to give them something they cannot pay for. We have been living in the past, and in my opinion we must wake up. Thirty years ago we had a greater attendance at the opening of the meeting than we have today. Thirty years ago with a membership of about 300, we had a better attendance than today. Why is it that when we have 1,800 members we have only about 150 here at this meeting? I do not know what the disease is and I have not heard anybody here say what it is—nobody offers a diagnosis. If I have something bothering me I like to know what it is.

There is one point in the President's address that I would like to speak of and that is his suggestion that the older members, the life members have something to say about the finances of the association. I think this is a good suggestion. Heretofore we have many times thoughtlessly appropriated funds of this society when we did not know what we were able to take care of. This was done thoughtlessly in many cases, but whenever we get to the point that we are so sentimental that we give thousands of dollars without some little consideration, or knowing whether we can afford to spend it. I do not believe we should be so foolish. I am saying this because we are borrowing money to run this society. I believe it is all right to appropriate money for sentiment if you have the money to appropriate, but if you have not, cut it out. I believe a man who has been in the harness of this society until he has earned his life membership, who has been a regular attendant and who has been faithful to the society, is able to look after the finances in a very satisfactory way. I believe we have money enough to run our society even with the conditions that we have today, if we would judiciously use the funds we have in a business-like way.

DR. G. D. SITHERWOOD (Bloomington):

You have all noticed that the churches that have a large congregation have a good preacher. Now we have a good many

poor preachers in this society. I happen to be one of them so I am not on the program very often. But this matter of money is a serious question, I assure you. I am very much in favor of Dr. Bentley's suggestion that a commission take up this matter and make a report as to what we should do, and not take up so much of our time in talking about it at this meeting. However, I am not discouraged about the Illinois State Dental Society; it will go on just the same, it will have the usual membership and get along as well in the future, and better, than in the past.

I can give you a pointer as to one society in the State, and let me tell you something about it. The McLean County Dental Society a year ago planned to bring some men from New York city to give us some addresses. The first man came, it was a very admirable address and we enjoyed it and had a great meeting. At the beginning of that session we had not any money, but we got up a fine program just the same and printed them and sent them out and the man came here and gave us a fine address and we sent a man around and asked one dollar from each member, which they gave, and we had plenty of money to pay that man. Then the next man came and we still had no money in the treasury, but we had a good meeting and we went around to the members and asked them for a dollar again and they gave it. Then we had the third man come and had what we considered the best meeting and the finest address that we had had during the year. We still were without money to pay this man for railroad fare, etc., so we raised a certain amount and tendered the money to him and he would not take a cent, so we are flush and have money in the treasury. Now I claim that what can be done in the McLean County Dental Society can be done in the State Society. If they will send for the money we will be glad to help and we will have all the money we need and get along in fine shape.

DR. G. W. DITTMAR (Chicago):

I do not feel half as pessimistic as a good many speakers and I am surprised at my friend, Dr. Bentley, for making the speech he did. Bentley had the chance of a lifetime to do something at this meeting, and if he is not satisfied with what he has given us I do not know who is to blame. Bentley says, "What is the matter with the Illinois Dental Society?" and then he racks his

brain to find out. I put a bigger question than that, "What is the matter with this old world today?" That is what is the matter with the Illinois Dental Society. As soon as the war cloud rolls away I think we will have a better dental society. At the present time we have so many demands on our time and our pocketbooks that we cannot give as usual to the dental society. I think that is the primary thing that is wrong at the present time. I am not at all discouraged. We really are to be congratulated on the meeting this morning. Do you remember about a year ago at the close of the meeting it was whispered that we were not going to have a State meeting this year, that we were going to have a perfunctory meeting in conjunction with the National Association in Chicago? That has had its influence in making this a small meeting. That is one thing that is wrong with this particular meeting. We are going to have a big meeting in Chicago in August and many more men would be at this meeting to day if it were not for that meeting coming along. So the whole thing does not look so bad to me at all. I think after the war clouds roll away and we get back to earth again we will still have just as good an Illinois Society as we have had in the past. I do not think we have degenerated at all. We have a fine program. The men who appear on this program are authorities in their line, but the reason we have not so many here today is because they expect to hear this same thing in Chicago in August. What we want to do is to have this address referred to a committee and have this committee make a report and clarify the atmosphere. I will make a motion that the President's address be referred to a committee of three ex-presidents, who will review this address and report later to this meeting.

(Motion seconded by Dr. L. L. Davis and unanimously carried.)

DR. C. E. BENTLEY:

I never could understand the psychology of my friend Dittmar; it is beyond my comprehension. But if I gave the impression to this audience that I am pessimistic I did not intend to do so, and I want to say furthermore in answer to Dr. Dittmar that I am not at all discouraged about this meeting. This is one of the most encouraging meetings we have had. But if you will remember at the Peoria meeting in 1911 we had an attendance of

700 and then we had a membership less than we have now and since then we have been increasing the membership but decreasing in attendance. I want to get at the cause why the men do not come to these meetings. I have a reason—I will not state it here, but there is a reason in my mind. But so far as the war is concerned and this program is concerned this is a splendid opening meeting in spite of the handicap and in spite of the reduced finances. I am very much encouraged with this opening meeting. It far exceeds that at Quincy last year, when we had just entered the war.

So far as my being able to distinguish myself on this particular occasion you will have an opportunity to judge how far I have gone in that line at the clinics when you see them.

DR. T. A. BROADBENT (Chicago) :

I did have something in mind that I wanted to say but Dittmar rather took the wind out of my sails, because up to the time of his speech everything seemed to be pessimistic and I wanted to begin to inject a little Optimism. I am not discouraged over the situation in Illinois, especially in Chicago. We have had one of the best years that the Chicago Dental Society has ever had. To what do we attribute that? To the fact that we have had attractions. We have had the biggest meetings in the history of the society throughout the year. Our meeting place has been inadequate to accommodate the crowd that attended. On one or two occasions some of the men could not find standing room. The smallest attendance has been 325 and we have had 500. The reason is that we have had attractions, and that is what you will have to have to get a large attendance at this society. I do not mean this year, because conditions are different. One reason they do not attend is that they get so much out of the membership without attending the meeting—they get the JOURNAL and the proceedings and they consider they are getting their money's worth without attending. Another thing, we have been getting in a very large percentage of the recent graduates, men that are not financially able to attend these meetings. They are not dissatisfied with their membership; they think they are getting their money's worth. I think these are factors that are not being considered in discussing this situation.

In regard to finances, it is my opinion that without raising

the dues we can run along with the same legitimate expense as the last few years without the extra contributions we have been making and that in another year or two our finances will adjust themselves on the present basis. I do not think it is a good time to raise the dues. I think the dues ought to be higher but we should raise them to \$10.00 at one time rather than \$1.00 at a time. We get very few complaints about dues from members who drop out.

I want to make a correction in the apparent loss of over four hundred members. In Chicago a year ago we had a larger delinquent list than now, but at the end of a year we lost less than fifty members. We have at the present time about 150 that have not paid this year's dues, but I am satisfied that before the first of the year comes around three-fourths of them will have paid up.

DR. J. E. HINKINS (closing):

I want to thank you for the discussion you have given this paper, and I will say that your officers have run our society for the last year on the same business principles that they would use in running their own private affairs. If I have made a success professionally this society knows as much about it as anyone else. If I have made a success financially I know it better than anybody else.

The cause of the poor attendance at this society is lack of service. We have probably the best program for a number of years, but I have been a member of this society for 32 years and it is run on the same principles today as when I came into it. You cannot get good service for third class pay. You have to have money and we have to have money. We are not bankrupt yet. I am encouraged and others are encouraged. I think the suggestion of Dr. Bentley will to a certain degree reach the cause, but in order to give service you must have money. I have had a letter from the secretary saying that we had over \$900.00 in the treasury and he wanted to plan for some Liberty Bonds, but after consulting with the Ad Interim Committee we advised him to buy only a \$500 bond and keep the other \$400 in the treasury, and if this 50 cents that we have been paying to the National Society, which we should not have been paying, is taken off again the Illinois State Dental Society, I think, will have pretty near

enough funds to run the Society until the close of the war, run it judiciously and give us the best service, and then when the war is over we can reorganize and see what we can do. I thank you.

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REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The Committee appointed to report on the President's address respectfully submits the following for your consideration and action.

The Committee uniformly agrees that the President acted wisely and with good judgment in selecting for his chief topic the financial problems of the Society.

This is a question of vital importance for the best interests of the society, and was presented in such a manner as to forbid any possible controversy arising which would in any way prevent the adoption of measures for the relief of this embarrassment.

The Committee has also fully considered the vague and brief reference in his address to the effect that the society must discontinue the thought of living on its past record and still expecting to be classed as a leader in the dental affairs of the future.

Therefore, the Committee submits the following recommendations:

First,—That a Committee consisting of life members be created, to which Committee shall be referred all appropriations from the funds of this Society except those for the necessary running expenses. *Adopted.*

Second,—That the dues of the Society be raised to ten dollars per year, and that the members receive therefore, the annual subscription to the DENTAL REVIEW, the *Journal of the National Dental Association*, the *Monthly Bulletin* of the State Society and a cloth-bound copy of the Transactions of the Illinois State Dental Society. *Not adopted.*

Third,—That a committee be appointed by the President to submit a plan which shall increase the interest and efficiency of the state and component societies. *Adopted.*

Fourth,—That the recommendation of the President, referring to the Freer Memorial Unit be concurred in. *Adopted.*

Fifth,—That in the opinion of this Committee, the January meeting of the Chicago Dental Society as now conducted, is detri-

mental to the interests of the State Dental Society and that the special features of that meeting be discontinued. *Not adopted.*

Sixth,—We believe that the place of the annual meeting of the State Dental Society should be determined as it now is, by invitation. *Adopted.*

Signed,

W. A. JOHNSTON,
HENRY L. WHIPPLE,
J. G. REID, Chairman.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held May 7, 1918, with the President, Dr. J. H. Woolley, in the Chair.

Dr. E. A. Royce read a paper entitled "Combatting Mouth Infection."

DISCUSSION.

DR. AUSTIN F. JAMES:

Mr. President and Gentlemen: I have greatly enjoyed being here with you this evening and listening to Dr. Royce's splendid paper. His pictures speak for themselves. There is no question but what Dr. Royce is on the right road, and that he is doing some wonderful work. I wonder how much you are all interested in the idea of preventing the conditions that Dr. Royce has spoken about this evening. As I have followed this line of work for a number of years, I have realized the best I could do in all these cases is to get rid of the pus and get the gums in a healthy condition, and in some instances I have not been able to restore the tissues to their normal condition. We have teeth in which there has been considerable destruction of bone in the interproximal spaces. We have spaces that are difficult to keep clean; we have to have continuous help, and the realization of that fact has led me to think more and more each year, as I go along, how to prevent these conditions, and if it is permissible, what I may say will be more a discussion of the pictures Dr. Royce has presented rather than a discussion of the paper itself. These plates speak for themselves, and the most interesting feature of all is the idea of preventing these conditions. In studying the prevention of, we have to go to the children, the young people, that come to us, and it is a great regret that I have in

my practice not more children to deal with. I have talked prevention to the parents. Every parent that comes to my office is instructed with reference to the possibility of preventing diseased conditions and decay of teeth, and I hope in time to get more children in my practice, so that I can teach them methods of prevention.

I find in studying newly erupted teeth that there are many teeth that have not smooth enamel surfaces when they come into the mouth; that we have thickened hypertrophied gums to deal with, which makes it impossible to keep the mouth clean. These things lead to a chemical reaction going on in the mouth, and as a consequence we have fermentation, and when I speak of fermentation I use a term of my own in regard to mouth conditions that I have adopted, and I do not know whether you all know exactly what I mean. I can illustrate it by using the expression "a dirty healthy mouth." For instance, we see an Italian or some other fellow who has never brushed his teeth or given his mouth any daily care, and still he has what we call a "dirty healthy mouth." His gums are pink and hard, and the tooth surface will not decay. He has no serunal deposits, and he has no really diseased condition of the teeth. In the mouth where fermentation is going on we have a chemical reaction due to unclean conditions, particularly in people who are living sedentary lives, living indoors, who do not exercise very much, or perhaps not at all, who are eating all soft foods, and by and by conditions get to the point where we have a chemical reaction going on in the mouth leading to irritation of the gingival margin and finally the deposits of calculus on the teeth. We think of accumulations of salivary calculi on the exposed surface of the teeth as a matter of course. In other words, a great many dentists seem to think that salivary calculus must occur on the exposed tooth surfaces. We realize now that we never have salivary calculus on an absolutely clean tooth surface, but there must be roughened enamel surfaces or difficult tooth surfaces to keep clean, and the sticky mucus forming on these surfaces holds the salivary calculus. We never have a serunal calculus occurring on the root surface under the gum margin until we first have a local irritation of the gum margin. When dentists fully realize this, they will come to an appreciation of the importance of prevention, so that I take children showing thick hypertrophied gums, with a sticky mucus forming on the enamel surfaces, and in every such surface I am able to

demonstrate that the enamel is rough, and in the smoothing process it is necessary to go under the gum margin and do instrumentation and smooth the enamel surface and teach the child some method of hardening and massaging the gums. When we study the mechanics of our teeth we realize that the central incisors are for incising; that the cuspids are for tearing tough meats or fibrous foods, and that the molars are for grinding purposes; that heavy usage of teeth moves the teeth in the alveolar process. There is a slight give there, and this motion of the teeth with friction of foods over the teeth develop the dental ligament of the gum margin. As children are growing with roughened teeth and unclean tooth surfaces, we have the undeveloped dental ligament because the tooth does not receive the exercise that nature intended.

The dentist must take the responsibility of smoothing all tooth surfaces and substituting massage for the lack of motion of the teeth and lack of friction over the gum margin to harden and develop that dental ligament. I teach every patient, either child or adult, after I have done the necessary work of smoothing the tooth surfaces, how to massage the gums. I do not give them a mouth wash or a dentifrice. By massaging only, the hardening or tightening of the gums around the neck of the teeth takes place.

DR. F. E. ROACH:

The subject presented by Dr. Royce is one of great importance, and I am sure we all recognize that, and in the main I think there is little in the paper that I can disagree with. We are all fully in accord with the importance of a closer examination of our patients as they come to us for these bad conditions that the essayist speaks of. We are all prone to overlook many of these apparently insignificant conditions of the mouth when it is our duty to detect these things and remove the causes or remove these conditions that are likely to bring about the diseased conditions we are constantly striving to remove after they have developed; and I was very much pleased with Dr. James' remarks upon this phase of the subject, and there is no doubt we should all pay more attention to the condition of mouths in the way of prophylactic or preventive measures. The greatest good we can possibly do to the people that come to us is to prevent these diseases as much as possible.

I was particularly pleased with Dr. Royce's position with reference to the careful and sane use of the instruments he employs. Dr. Royce uses these instruments intelligently. I do not care what instrument Dr. Royce uses, he will use it intelligently, judiciously and carefully, and get good results. He could take a jack knife and remove tartar from the teeth and plane them down. I was particularly pleased with his conservatism and his plan of using the instruments and his reference to the use of all of them intelligently. We know that the propaganda of pryphylaxis and the cleaning of teeth has been abused. It has been carried too far. Men have gone to the extreme, and many sets of teeth have been ruined by following out this teaching. I am sure Dr. Royce does not do that; he has got too much sense; but where he may use them intelligently, many men have used them to great detriment.

DR. L. L. DAVIS:

The method by which a man accomplishes an end matters not, so long as he does it. Whether Dr. Royce uses certain instruments for this purpose or the Dunlop vapor or Cazier's solvent solution, or any other method, if he accomplishes what he starts out to do and gives the patient relief and comfort, he has done his share. I do not think we are starting at the right point. The trouble is with the young men studying dentistry in a dental college. I have noticed for years and in my association in dental teaching, that the average young man when he gets into the infirmary, if he can get some other student to do the work of cleaning the teeth, he will do so. He would rather put in a gold filling, make a crown, or do some other thing, rather than clean teeth if he thinks he can make a dollar or two out of it when he begins practice. The trouble is in teaching dental students. Every student should be instructed, and it should be insisted upon in his work that he clean a set of teeth properly, and not only one set, but every mouth he comes in contact with, and the first thing he should do, before he does any reparative work, should be to clean the mouth, put it in a healthy condition. And so this paper appeals not so much to the men who are present tonight, because there is not a man here who does not practice as much as possible preventive dentistry, as it does to the class of dentists I have spoken of. I think every dentist in this room

does his bit to prevent rather than cure disease all the time. We all do a certain amount of proselyting and teaching of parents.

This paper is timely, and the only objection I have to it is that the essayist has not emphasized strongly enough the necessity of every dentist cleaning teeth. We may talk about prophylaxis and polishing tooth surfaces and such like, but I venture to say that 80 per cent of the dentists in Chicago do not know serumal calculus from pyorrhea. They do not know a case of pyorrhea when they see it.

I had a case referred to me recently from one of the government camps. The patient was a young man in the aviation school. He was home on a furlough. He had graduated from the school of aeronautics, and is going to the flying school. He happened to get acquainted with some government dentist, and that dentist told him that he had a nice set of teeth in his mouth but he had pyorrhea. When he came to Chicago he consulted me. He is 18 years of age and has a beautiful set of teeth, but about 8 or 10 years ago some dentist must have tried to destroy the pulp in a first bicuspid with arsenic and drilled a hole through the side and applied arsenic and the result was a necrotic alveolus, with exfoliation, recession of the gum tissue, and the necrosis still progressing because the root filling that was placed in later on extended out of the opening, and the whole thing has been a source of irritation since the filling was inserted. I removed the tooth and curetted the alveolar process, and told him that when he went back to the government dentist that it was necessary to remove the tooth, but that he did not know pyorrhea. That is the whole secret of the thing. The average dentist does not know pyorrhea when he sees it, and I blame it largely to the schools. This is nothing against Dr. Brophy or Dr. Johnson, but I am simply saying that we do not insist enough upon the student doing his bit and that he should not slide off a dirty mouth to some other student if he can get out of it and can get hold of a nice clean mouth and put in a gold filling, a gold inlay, or do something of that kind.

DR. C. N. JOHNSON:

This is a very important subject, and the paper is very timely. I want to express my appreciation to Dr. Royce for the character of paper he has given us tonight, and I want to go on record as

saying that Dr. Royce carries out in practice what he has told us. He has done me the honor of bringing me into his office and showing me a case which was completed, and it was a very beautiful piece of work. I consider that Dr. Royce in the management of that case did that patient a very definite and tangible good in cleaning up his mouth and making it healthy. I did not see the mouth while it was unhealthy, but there were evidences very plain that it had been unhealthy. There was much destruction of the alveolar process, particularly in the region of the lower incisors, where we find that so frequently, with recession of the gum, and when Dr. Royce took that case and put the mouth in as normal condition as possible under these conditions, I consider that he has done for that patient a definite good, and that is the highest practice of dentistry. He sent for me on two different occasions to see that mouth, and I was greatly impressed with the work he did, and I want to pay him this public tribute.

This whole matter of the effect upon the system of unhealthy mouths is a very significant subject for us to study. It is not a new matter. These things come in cycles. Many years ago I can remember the same agitation was on, not quite so acute as it is today, but statements were made away back 25 and 30 years ago, by dentists, of the conditions of the mouths of patients and their relation to the system generally, and now, when we are told the same thing by medical men, many dentists come to the conclusion that it is a new idea. I know Dr. Royce said this thirty years ago, and it is something that the dental profession tried very hard to get the medical profession to take cognizance of at that time, as far back as I can remember. The dentist in taking a mouth in the condition outlined by Dr. Royce and by Dr. James, where the gums are hypertrophied, and these deposits are creeping under the free margin of the gum, and placing the mouth in a normal condition by the methods that have been outlined, is doing a definite good to that patient. I believe as Dr. Roach or Dr. Davis has said that most of the members of the Society are in the habit of treating patients in that way. We may accomplish it by a little different technic, but I believe it is clearly in the mind of every member of this Society that is the proper thing to do, and I do feel that the profession generally are becoming more alert, more alive to the necessity of removal of deposits

from teeth. We do not remove these deposits as perfectly as we should do, but we have a very clear vision of its necessity. I am going to make a suggestion to Dr. Davis. I think he is away behind the times. If Dr. Davis were to take a course in one of our schools today, he would get thoroughly drilled in the removal of deposits from teeth and not be permitted to put a gold filling in a tooth that has a deposit on it; he would be sent back with that filling. That is a fundamental requirement. We do not accomplish ideal results with students. If we take a given number of dentists who graduated eight or ten years ago, we will find we will not get ideal results from their work. But I want to assure Dr. Davis that in the teaching today in the colleges there is great emphasis placed upon the necessity for removal of deposits from the teeth and making the surrounding tissues healthy before there is any restorative operation done on the teeth. It may encourage him to know how stringent that requirement is, and no student can get by any of the colleges that I know of today without having the ability to remove deposits, and to meet this requirement it requires just as high an order of skill as it does to insert a gold filling. I know students complain more of that than anything else, but if we are accomplishing anything today in our college teaching we are instilling into the minds of students the significance of this one thing in dentistry.

I shall say nothing about instrumentation. I admire Dr. Royce in his skill, and Dr. James in his skill, in the manipulation of the instruments that they use for this purpose. I do not believe that it is possible for all men to accomplish the same results in the same way. I do believe, however, that the reputable members of the profession are trying faithfully to remove these deposits and to make the mouths of their patients more healthy, and I will close with this remark, that in doing that one thing the dental profession is rendering a service to the people that is more significant and is more powerful for the development of health among the patients than any other one thing that I know in connection with the profession.

DR. J. E. HINKINS:

I do not see that there is much left for me to say after the very thorough discussion that has taken place. I enjoyed Dr. Royce's paper very much. I am familiar with his views on this

subject; I have seen him operate, and know the earnestness with which he tries to clean these teeth, and he does it as successfully as any man I have seen, and therefore, I cannot do anything else but appreciate the efforts he has put forth and the results he has achieved.

In my own practice, for the last four or five years I have been treating pyorrhea along the lines recommended by Dr. James. I am practicing today more preventive pyorrhea treatment than I do curative. There was a time when I felt it was almost a sin to extract a tooth if it could be held in place by a wire or brace; but within the last few years I make it a practice to examine the mouth of every patient as thoroughly as I can and to make my diagnosis as accurately as I can along the lines laid down by Colonel Logan, namely, I do not care what the X-ray shows, if one-half of the gum has receded or a little more, if the patient has a multirrooted tooth, and it goes down and shows a growth or deposit underneath, I believe in extracting such a tooth because you cannot scrape it clean, and if you devitalize the pulp you will have no permanent result.

Each one of us has his own method of manipulation, and each one works to attain the best possible results, from a physiological standpoint for our patients, and what one man may do with one set of instruments, another man will do equally well with a different set of instruments.

DR. ARTHUR J. ANDERSON:

It is with a good deal of pleasure that I received this invitation from Dr. Royce to be present tonight. It was through him and in seeing his patients that I have become interested in this preventive work, and I have had more satisfaction out of the practice of dentistry since I took up this work than I ever had before, and I have also had better satisfied patients. I have only practiced this preventive work for the last two years, but in that time I have achieved what I consider some remarkable results.

One young man was sent to me for extraction of teeth. He was a patient of a dentist outside of the city. A second bicuspid was badly abscessed and I advised the removal of the tooth. This was done, afterwards curetting. This young man had a goiter for three years which had gradually increased in size until he was wearing a 19 collar, and after the extraction of this second

bicuspid he began to notice that his collars were too large. He secured smaller collars until he is now, after six months, wearing a 15 collar, showing that the goiter was undoubtedly due to the abscessed tooth.

I believe in taking out most abscessed teeth where there is a large area of infection, and in all cases I curette.

I agree with Dr. James that if we could take children and commence this preventive work with them, we would do a wonderful amount of good to them and to the profession. I do not believe that most dentists lay enough stress on the cleaning of teeth or preventive work in dentistry. They will take a little pumice stone and polish the teeth and tell the patient the charge is one dollar, and they consider that cleaning the teeth. We all know that is not cleaning teeth, and the patient would be just as well off if he had not had his teeth polished and would be a dollar or two ahead.

I use the Dunlop vapor gas and have had wonderful results in the growth of new tissue. I have a case where a second radiograph shows a new growth of alveolar process. I have several radiographs showing the process has come up around the tooth. If I cannot get results with the instruments I use, I make use of files and vapor gas. I believe that if the colleges all taught a certain technic in the treatment of these cases, the young men going out of the dental colleges would be better dentists and would be able to turn out better fillings than they are doing now. I do not believe that any good dentist would fill up the interproximal space with an amalgam filling and leave it, because he is not taught to do that kind of work.

DR. TRUMAN W. BROPHY:

With reference to prophylaxis, the whole thing resolves itself into the one question of preserving the teeth and their adjacent tissues. Anything that can be devised that will assist the dentist in more thoroughly accomplishing the work of preserving the teeth is certainly of great value.

Different devices have been suggested, and these devices are now being employed in this work. I have the greatest regard for the men who are devoting themselves to the subject of oral prophylaxis, and the men who are honestly at work in that field are accomplishing a great deal for the good of mankind.

I think it was Dr. Davis who spoke of the different men who have been prominent before the profession in certain lines of practice. Reference was made to Dr. Cazier. I do not suppose Cazier's method of making use of his instruments has met with universal adoption or has been largely accepted. While I am outside of this work, I have nevertheless opportunities for observation, and I know something of the work that is going on. Let me say, in the first place, so far as planing is concerned, I am satisfied that there is altogether too much so-called planing. I know that teeth are planed down so that the cortical surface of the cementum is cut away in part, and the organic matter of the cement is exposed to irritation from without. One who is so unfortunate as to have that sort of thing done lives a very unhappy life until nature has, in a measure, repaired the injury.

When Professor August Bier, of Berlin, came out with his theory of hyperemia in the treatment of inflammation, it was regarded as a rather erratic declaration. But Bier had thought the subject out very carefully before he saw fit to publish his findings. He not only had thought out his method carefully, but he made use of it in the treatment of inflammation to such an extent that he knew exactly what it was and what it would accomplish. Does it not seem like plain common sense if in a congested part you can take away the congested blood and bring fresh blood to the tissues and oxygenate them, stimulate them to a higher degree of vitality, it is doing a great work? Certainly. When one thinks of that, he has only to realize that it is a great work. Now, whether Dr. Cazier had in mind the wonderful work that Dr. Bier did in inducing active hyperemia in the treatment of general inflammations, I do not know, but he evidently felt it was desirable to do something in that line and in a mechanical way to relieve the parts of chronic congestion; to draw away from them the noxious material, deep-seated, that might be there. So he invented this little device like an impression cup that fits over the teeth, made of flexible rubber, and attached a pump to it to draw the secretions away that accumulate about the teeth. I have seen this device used very successfully. Dr. De Rismer has one of these appliances and he is using it extensively. When a dentist takes away the deposits skillfully from the teeth and all sources of irritation that may mechanically

disturb them and follows out an old principle in surgery, he is doing great good. This principle in surgery is, that when a part is in an abnormal state, put it to rest. You cannot do anything with a tooth when it is wobbling around. You cannot do anything with a part that is in an abnormal state or a joint that is disabled while it is always moving. You must put it to rest, and by doing that to a tooth you are taking the first step in bringing about normality. Many teeth would get firmly imbedded in the sockets if the dentists would fix them so they won't move. I have never used the Cazier instrument, but I know men who have used it have done very well with it. The principle is right. If you can get congested blood out of the way and bring in fresh oxygenated blood, stimulating the tissues by bringing in fresh healthy blood, you are accomplishing a great deal. Instrumentations is all right, but instrumentation is by no means all. Other things must be considered. You must consider these cases from a physiological and pathological standpoint, and endeavor to make use of those measures that will bring about normality.

DR. P. J. KESTER:

I cannot help but add my word of appreciation to the paper that Dr. Royce has given us tonight. Dr. Royce and many of the men who are studying these special subjects are teaching all dentists a lesson in efficiency. In other words, no scientific man can judge of results unless his results are carefully recorded, tabulated and studied. I have gained a larger appreciation from the skiagraphs exhibited tonight than I ever had before, inasmuch as Dr. Royce has been able to demonstrate by these skiagraphs certain results which he has obtained by following certain methods. The great trouble with us all is that we keep accurate records of the teeth we fill, the state of the teeth, the material we fill them with, but as to keeping a scientific record, I do not suppose there is one man in a thousand who studies his work from a scientific standpoint and follows it scientifically.

It has seemed to me for a long time that there is a great deal in the prophylactic treatment of teeth. Dr. James was kind enough to endure me in his office for many years, and I saw him during that time do much of this work. I saw his earnestness, and in that day he worked hard to develop a system which would result in the salvation of the teeth. It seemed to me that many of his theories

were fine spun, and yet I can see the logic of them. Many of you may recall that we were shocked by an article which appeared in one of the British dental journals criticising our crown and bridge work in this country. We were not only shocked, but we were indignant, and yet after a more deliberate consideration of the subject, when we came to look into the subject ourselves as it was evidently looked at from abroad, we began to discover that those men were not so far in their criticisms of the work we were doing here, and while we realized that a large proportion of the irritations and inflammations about the teeth were produced by ill fitting bands and crowns and all that sort of thing, yet it was the other fellow who was doing that work until finally we realized that we ourselves were no better than the rest of them. While I have not been in the active practice of dentistry for a long time, I suppose the old fashioned shell crown has become almost obsolete; that it is not considered good form to put one of these crowns over the tissues and trust to luck.

DR. J. G. REID:

There are some things about the paper of Dr. Royce that I like, and some things I do not like. If anybody can give me any reasonable excuse why a tooth should be planed, I want to take off my hat to him. When you remove salivary calculus you have planed the tooth, and that is all that is necessary. You are planing it in removing the calculus with a lot of mucus. You cannot use these instruments and attempt to clean off salivary calculus without doing injury to a part of the tooth that you have no necessity to do anything with. What is the necessity for planing a tooth?

Let us take Dr. Laurence, a man who did perhaps as much as any living dentist in taking care of pyorrheal teeth. He worked at it long before I became a member of the state society. Dr. Laurence talked about removing salivary calculus from the teeth more than 40 years ago, and the latter part of his professional life was devoted entirely to that sort of work. He made use of a large number of instruments for removing salivary calculus. He did not talk about planing teeth. If he could not get an instrument on the market to do that sort of work, he made one to suit himself. I have seen dozens and dozens of the crude instruments that he made himself to perform a certain piece of work.

All he wanted to do was to remove the calculus, and having done that he stopped. He did not do any planing, and there is no necessity for it. If you remove the calculus, the teeth will get well, and you do not have to cut off a lot of good tooth substance. Planing teeth is bad practice. If I should scrape the skin off my finger and keep on scraping it until the bone is exposed, and expect the thing to heal over, I would be mistaken. It will not do it, and you have got to convince me to the contrary that I am wrong.

The next point I wish to speak about is with reference to prophylactic work, and Dr. James directed my attention to that in his opening remarks. I do not think there is any reason or excuse for a man making any mistake about observing the preliminary symptoms of diseased tissue. It is manifest the very moment the patient presents himself to you. If there is any irritation about the gum line from salivary calculus, it shows itself in a gingivitis immediately, I don't care how trifling it is. But it is overlooked sometimes or forgotten, but I do not believe there is any excuse for making any mistake in observing gingival disturbance which manifests itself immediately with the simplest form of irritation, and you must not overlook putting the tooth or teeth immediately in proper condition.

A serumal deposit is secondary to salivary calculus. We have a salivary deposit first, and then we have irritation of the gum. If you observe these conditions in the mouth from time to time as they present themselves, you can keep the mouth in a sanitary condition. Those are points I think that are frequently overlooked, namely, the early manifestations of serumal or salivary deposits.

Dr. James' expression of a dirty healthy mouth is a very good one. It is true, sometimes we see a clean dirty mouth. If you do not watch the case closely and examine it critically you can overlook some of the conditions existing there that would startle you on making a further examination. There are films of deposits that appear around the necks of teeth and the gums look perfectly well and healthy. If you look into the mouth of such a patient, you will see nothing but evidence of perfect health. In those instances you may find that there is a good

deal of salivary deposit, a film of salivary deposit, and yet the condition of the gums does not indicate it.

DR. SIDNEY J. KNOWLES:

I made a number of notes during the reading of Dr. Royce's paper, and the first thing that occurs to me is the comment of Dr. Reid as to the necessity of planing teeth. I agree with him that I do not want the skin scraped off my knuckle down to the bone on a healthy finger; but I do want the diseased bone in my finger, if possible removed. That is my understanding regarding the removal of tooth structure that is diseased. It is not sufficient to remove the salivary calculus which is the result of inflammation, and then seal up the blood which produces a condition of congestion, but it is essential to remove the stale blood, so to speak, as pointed out by Dr. Brophy. After you have removed that, as a result of that having been there, there is more of a deposit. The peridental membrane in many instances has been destroyed entirely, and as long as there is disease of the peridental membrane, you will not get a healthy condition. So the intelligent removal of that is a necessary thing to do. You remove that with instruments that pick off the calculus, and in my hands I can do it more definitely with instruments that I can control. You may call it planing or not, but it is possible to remove the calculus better by a particular instrument, and at the same time remove the diseased tissue with less effort.

I want to take this opportunity to say that there is not a man in the dental profession that could present this subject and have it given more weight than a man like Dr. Royce. We know that there are still men in the medical profession who give calomel to the exclusion of everything else, but I think a man who has practiced ten or twelve years, who will become interested in this work, you must acknowledge he is not an enthusiast to be carried away by any new scheme. Dr. Royce has gone into this work, and his intense interest has impressed me that he is a conservative man and his enthusiasm carries weight, and he is to be complimented for doing this thing in the way he has.

I have not taken up the Dunlop spray. It has seemed to me to be a sort of makeshift. I have heard the disadvantages of this spray, but I can see there is probably great good in it. I have had bone regeneration in cases without the Dunlop vapor

in a limited number of instances. I have been able to remove calculus and diseased tissue in many cases and have succeeded in establishing a condition which I could not do with anything else I ever used.

DR. BROPHY:

What is the Dunlop spray?

DR. KNOWLES:

It is oxygen gas generated through some chemical.

DR. BROPHY:

What do you do with it?

DR. KNOWLES:

Dr. Royce can describe it better than I can. I would like to ask Dr. Royce what he means when he says a blood examination shows infection. I think that is getting right down to the fundamentals. That is a thing we should know. So far as I have gone, the blood has not shown a definite reaction to ordinary focal infection in the mouth. I may be wrong about that, and I would like to have the opinion of Dr. Royce about it.

Dr. James raises the point of getting these cases before they have reached diseased states by establishing conditions which will increase the tissue tone. That is the thing you do when a man has tuberculosis. When you build up his nutrition and enable the organs to functionate as they should, he is in a position to fight the organisms of that disease. It is likewise true in the mouth. If we can remove the salivary calculus and get the mouth in a healthy condition, and follow it with advice and instruction to the patient and have it carried out, we can accomplish a great deal. It goes without saying that band irritations and projection of fillings are things that should be guarded against as far as possible. I think it is difficult to put amalgam in such teeth, and I object to it. Our modern inlay method in the majority of conditions as we see them is more sanitary than anything we have had.

Mention was made by Dr. Anderson of the thyroid gland reducing in size after the removal of an abscessed tooth. Of course, there is nothing definite to prove that. If we could have the experience of a number of men about the elimination of infection and the reduction in size of the thyroid gland as a consequence, it would be significant. We know that the thyroid

gland may become enlarged as a result of infection in the teeth, tonsils, or appendix. It is usually the result of infection somewhere.

Some one made a statement with reference to overinstrumentation of teeth, and I do not hesitate to say that I believe more teeth are lost through a lack of instrumentation than from overinstrumentation. That is probably a broad statement to make, but I have thought of that ever since it was made tonight, just as I believe more teeth are lost through a lack of brushing than from overbrushing on part of the patient.

The very vital thing that confronts us all is the question of what teeth to scale and what to extract, and I was glad to hear what Dr. Hinkins had to say regarding that phase of the subject. I agree with him that it is better to extract some teeth than to attempt to treat them. One reason why I make that statement is this: I had the case of a man, weighing 190 pounds, who presented himself with four teeth in front of his mouth that were diseased, and there was nothing to do but to extract them. The question of putting on a plate came up, and this man had no process along the ridges of the molars. It was the flattest mouth with loss of the ridges I have ever seen. I have a model that will show it. If that man had been treated and had had these teeth taken out long before they were lost through destruction by pyorrhea, he would have had a better mouth to have received a denture.

As to the question of people having pyorrhea, I had a young man come to me, about 16 years of age, whose lower central incisor stood out of line, with a beautiful looking mouth. I do not believe I have seen a healthier looking mouth in a boy. He was told by two men that he had pyorrhea. He came to me, and my understanding is that pyorrhea means a flow of pus, that is, the advanced stage starts possibly through the roughened surfaces of the teeth and then gradually increases and develops. This boy was scared stiff. He had visions of losing all of his teeth. It was the only affected tooth in his mouth, and that was the result of a fall some years before and the tooth was a little out of line, and it was the only tooth he could strike when he closed his mouth—malocclusion. I said to him that he did not have pyorrhea. On the other hand, pyorrhea ought to be recognized

in conditions in the past that have been passed over as being pyorrhea when they start at a certain period of time and result in pyorrhea, and can now be recognized with such treatment as Dr. Royce has outlined.

I think it is possible—in my hands I know it is—to remove these deposits and render the surfaces of the teeth smooth with an instrument of the type Dr. Royce has described. I cannot do it so well with other types of instruments.

DR. ROYCE (closing):

As to the subject of prophylaxis or prevention which Dr. James spoke of, I did not include it in speaking of mouth infection because my idea is that at the present time we are not far enough advanced so that our patients will allow us to fight mouth infection in that way. In the last phrase of my paper I stated that in the near future dentists would be practicing prevention of decay and accumulation of calculus. In the future, the teeth of the American people will depend upon the proper nourishment of the teeth as outlined by Dr. Hinkins (in a paper he gave us some months ago), supplemented by proper prophylactic treatment for the teeth and gums of the children and young people.

We all appreciate the fact that there is opportunity for the incompetent dentist to do damage in the mouth. And perhaps there is no single phase of dentistry in which more harm can be done to the teeth than in pyorrhea work. I know very imperfect work is done, but that does not change the fact that fine results are being obtained by those who do the work properly.

As far as teaching in colleges is concerned, the principles that are advocated in this work by Dr. James, Dr. Clark, Dr. Knowles, and many others are tabooed by a great many college men. Why, I do not know.

The case Dr. Johnson spoke of I finished two years ago. I had seen the case but once since, and that was a year ago. The day Dr. Johnson saw the teeth I had spent just one hour cleaning and polishing them. It would be impossible to make a mouth of that kind presentable, in that length of time, unless the teeth had been polished previously.

I forgot to bring the records of another case that is very interesting. This lady came from New York, and was almost blind in one eye. I have the records from the oculist, with

charts, showing the range of her vision. The first range of vision was about two and one-half inches in diameter; two years later the range of vision had diminished to almost nothing, and the oculist said that the lady would lose the sight of her eye. She came to Chicago, and Dr. Girling began treating her teeth. After four months' treatment he sent her back to New York to have an examination made by the same oculist, and that chart showed her vision had returned to what it was two years before—two and one-half inches in diameter.

Cases of that kind make some of us enthusiastic, but other members of the profession are so much afraid that some men will grind through the enamel, or do other damage, that they have been very lukewarm toward this class of work.

CHICAGO DENTAL SOCIETY.

A regular meeting was held April 16, 1918. Dr. C. H. Oakman of Detroit, Michigan, gave a lecture on "The Disastrous Results of Neglect of Oral Hygiene."

DISCUSSION.

DR. C. N. JOHNSON:

Mr. President, and Ladies and Gentlemen: I am sure that it is the consensus of opinion of this audience that we are under deep obligation to Dr. Oakman for coming to us and giving us this presentation.

I shall not attempt to discuss the slides as thrown on the screen because they have been thoroughly covered by the essayist, and also because I don't know anything about the subject.

I want to refer to two or three statements made in the beginning, in the preface to his paper, as the essayist said. First, in regard to making examinations with the X-ray. Dr. Oakman made the statement that it was not proper to base an opinion on clinical evidence without the use of the X-ray, and he emphasized the fact that the X-ray should be used more than it is. I want to endorse what Dr. Oakman said in that regard, but I want to supplement that with the statement that it is not well to base an opinion upon the X-ray without the clinical evidence.

There is just as great a danger, it seems to me, of making

a faulty diagnosis in following the evidence as presented by the X-ray alone as there is in following the evidence presented by the clinical examination alone.

I believe that the X-ray is going to be more valuable in the future than it has been in the past; and it has been every valuable in the past. I believe it is going to be more valuable when men come to realize this fact: That in order to make a diagnosis we must have not only the X-ray but the clinical presentation.

The X-ray has misled us in some very important particulars. The X-ray has shown us evidence in some cases, and we have jumped at the conclusion that there was an infection when probably there was no infection. In other cases, it has seemed to present evidence that there was no infection when there was infection. The fact that we may make an X-ray of the teeth and find no area to indicate it, is not *prima facie* evidence that there is no granuloma at the ends of the roots. When we see these pictures and see no evidence we must not jump at the conclusion that there is no infection.

This matter of focal infection is straining our ingenuity and our judgment to the limit; and we are not yet as intelligent in regard to the management of those cases as we should be in justice to our patients.

There are other misleading things in regard to the X-ray. I came on this floor—I think it must have been more than a year ago—long enough to warn the members of this Society against making rash statements on X-ray evidence. I mentioned the fact that there were pending in New York City at least thirty cases of malpractice against members of our profession based on X-ray evidence. And I made the statement then that that was not proper evidence upon which to base a suit for damages against dentists. And I warned the members of this Society particularly against making rash statements before patients in connection with X-ray evidence. Now, that is something to which this Society has got to pay more attention. We are going to have suits brought against members of the profession who have been conscientious in their work, on X-ray evidence in connection with root canal fillings.

Now, I want to make this other statement: That an X-ray

does not always tell whether a pulp canal has been filled or not. I want to emphasize that. There are some canals that seem to be well filled, according to the X-ray, that are not well filled. There are other canals that may be filled with materials that do not show up on the X-ray. We must bear that in mind. And when a picture is held up as evidence that a pulp canal is not well filled, we must say we do not know whether that canal is well filled or not. I think that fact should be made just as prominent as possible before the profession and before the people and, God knows, particularly before the lawyers.

This profession is liable to be subjected to a great deal of imposition unless we are very careful about making rash statements in public.

Dr. Oakman made one chance remark that impressed me as much as any other one thing he said in the paper, and that was this: There should be education widespread upon this matter of oral hygiene. That seems to me more important than anything else he said aside from the pathology that he showed upon the screen.

In our public utility work among children, we have tried to do faithful and conscientious work. We have tried to do public service for the children in the public schools. I think the profession is entitled to a great deal of credit for what has been done. We have relieved pain. We have filled cavities of decay. But from the very beginning of that work I have been impressed with the fact that the significant thing in all of that is the educational feature rather than the reparative feature. I don't believe in charity which helps to make people more helpless. I believe in educating people to help themselves. Now, I realized at the beginning of this movement that it was necessary to start in the way we did. We put clinics into our schools and we relieved pain, and it was necessary to do that to make the proper impression upon the public. You couldn't have gotten the consent of the Board of Education of this city or of any other city to put oral hygiene instruction in the public schools unless we had first given evidence of the desire to stop the pain and the toothache.

Now, relief of pain is a very beneficent act. But the instruction and education which places those children in the posi-

tion where they do not need to have pain is infinitely better. I don't know whether Dr. Oakman is familiar with this or not: Within recent months the Board of Education of this city has made an appropriation to hire an instructor in oral hygiene in the public schools of Chicago. That work is of infinitely greater value than all of the clinics that we have been maintaining in this city.

The essayist has called to your attention, as practicing dentists, the necessity of looking carefully in the mouths of your patients and watching for these incipient growths before they become larger. It is true many of them do not come to us until they are serious. But in handling children, and adults too for that matter, in our private practice, we can check up and head off very many of these malignant growths by a close observation and a very accurate and careful survey of the mouth every time a patient presents in our private chairs. And this should be done in the school clinics, too. That is something in which the profession has been a little bit lax.

As Dr. Oakman said in his paper, many of these grave disorders, as he illustrated tonight of the woman, might have been prevented without serious injury to the individual if they had been recognized in time.

Mr. President, I want to express my personal appreciation to the essayist for coming here and giving us this presentation. I know I express the sentiments of this Society when I say to him that he has entertained us most royally, and he has done us good.

DR. C. E. MEERHOFF:

Mr. President and Ladies and Gentlemen: I did not have anything definite in the way of manuscript from which to get an idea of what we are to discuss. It puts me in an embarrassing position.

Like Dr. Johnson, I am not competent to discuss these slides. I did think that Dr. Oakman was going more into the public service question and I thought he would take up the matter of the care of the teeth of the children of the schools, a work in which he has been very busy. As we all know, the city of Detroit has made rapid strides in the care of public school children, few cities of our country being able to show such results.

In his discourse he accentuates the need of educating the young mind along the line of sanitation, but in order to be effective some such law as that in effect in Bridgeport, Connecticut, would be desirable. As you know, the children of the public schools have compulsory care, such as prophylaxis, removal of deciduous teeth and simple fillings, up to the fifth grade.

The result of this system becomes obvious at once. The salient features of this discourse have been discussed, which leaves little for me to add without repetition.

DOCTOR C. H. OAKMAN (closing the discussion):

Ladies and Gentlemen: I can assure you it has been a great pleasure for me to come here tonight and to appear before your society; I consider it an honor to appear before such a society as you have here. It is known throughout the country as the greatest dental society in the world. I have always looked on Chicago as the medical and dental center of the world, and I think it will become more and more so as time passes. The great institution which will eventually be established in Chicago by the college of surgeons, will mark a new era in the history of the profession of surgery, and who can tell but that in the near future the dental profession might have established within the borders of your city an institution similar in character for the scientific advancement of the profession of dentistry.

The points which Doctor Johnson brought out in regard to the X-ray and clinical observations, would say that they must go hand in hand. I find many extracting teeth when the teeth roots appear to be quite perfect. A little darkened area at the root end does not necessarily mean that the tooth must be removed. Don't be in a hurry in deciding which teeth should be removed. It is a serious thing to extract good teeth, and still more serious if a diagnosis has not been made.

Dr. Meerhoff said that he thought this would be more along oral hygiene lines. I talk so much general oral hygiene that I thought this would be a deviation. The idea in giving this lecture was to show in the most vivid manner possible the necessity for oral hygiene. Hundreds of articles have been written and volumes compiled on the subject of oral hygiene in its various phases. The people, as a whole, and many of the dental pro-

fession are not fully aware of the fact that many of the conditions shown in these slides actually occur.

It is hoped that this article, when published, might be the means of drawing attention to this matter by the mayors, city fathers, health boards and school boards, so that oral hygiene might be taken up and practised in its broadest sense.

In applying for an appropriation to carry on Oral Hygiene Propaganda, it must be borne in mind that many men have had little teeth difficulties, and in fact, possibly, never sat in a dental chair, and therefore know nothing of the severe consequences resulting from the neglect of the teeth, but I feel sure that if aldermen or estimators could attend lantern slide lectures of this sort, it might be the means of causing a quickening of their better self. When we can show where flesh has been wounded and blood shed unnecessarily, and little children caused to suffer through no fault of their own, would it be possible that men with good hearts could turn down a plea of this kind?

This is also a great economic factor in that it improves the public health and saves human lives.

To show how men sometimes change their minds, where they formerly did not understand, I will relate an incident occurring some time ago. The chairman of the board of estimates, who did not want to do the disagreeable work, appointed a chairman pro tem. When I was president of the board of health, this position gave me the privilege of the floor of the council. The temporary chairman stood with raised gavel to "knock me down" every minute. The other estimators said, "Go to it and talk as long as you like." We brought the estimators this little girl with this horrible scar on her face and who had lost half of her lower jaw. We next presented the little fellow of nine years with cancer of the palate. We had a large water color made of the tumor after it was removed. We then exhibited the little fellow showing that his palate had healed and he was now well. A woman of about forty years also was presented, suffering from a focal infection of the upper jaw. Her face was greatly distended and she was showing evidence of marked toxemia. It was necessary for her to be supported by two nurses. She was so sick that she could not stand alone. When her face was touched, she gave a frightful yell, which was something that the

estimators were not in the habit of hearing. At the sight of these two children and this woman, the estimators readily saw the justice of our appeal for this cause.

That evening, an appropriation of twenty thousand dollars was passed unanimously by the board. The temporary chairman, who had opposed the appropriation so strenuously, came to me after the meeting was over and said, "I want to shake hands with you on what has been accomplished tonight. I am sorry I did not understand, but after presentation of these cases, I want to say that I have grandchildren of my own, and the sight of these children makes me feel that I am with you on anything you might ask for in the future."

I believe the living subjects who have undergone surgical interference following the neglect of the teeth are the ones to be exhibited to the city authorities when appropriations are being sought. In the absence of these, the slides are the next best to use. It would be well for the authorities in connection with appropriation moneys to visit clinics to observe the great number of cavities in the mouths of the average child, which denote in many cases, anemia and other distressing conditions due to the neglect of the care of the teeth and mouth.



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THE ILLINOIS STATE DENTAL SOCIETY.

At the recent meeting of the Illinois State Dental Society during the President's address, and particularly during its discussion there was a note of pessimism which crept into the proceedings out of all proportion to the facts in the case. It is well to "take stock" occasionally and get a proper estimate of our present status. It is wholesome to recognize our shortcomings, to the end that they may be overcome, but when individuals get to looking on the dark side of a situation they are quite inclined to conclude that it is solid black. The fact that the Illinois Society had run its treasury low at one time through very generous contributions to very worthy causes need not have started a brain-storm on the part of some of its members. It was perfectly proper for the officers to take note of the conditions existing, and to conserve the resources in such a way that the balance would turn in the right direction. This is precisely what they did, and they are entitled to great credit for their management of the affairs of the Society. The fact is that at the very moment the President's address was being discussed the Society had a substantial investment in Liberty Bonds to its credit. This was not generally known at the time, but it should have been known, and it would have headed off much of the lugubriousness which permeated the proceedings. The Illinois Society is not perfect, because it was organized by men, but it is far from being the poor old fossilized and decrepit organization that it was painted at the opening session at Bloomington. It is the largest dental society of its kind in the world, and it is doing good work—not of course as good work as it should, or as it will in the future—not as good work as it might have done, be it said, but withal it has a most creditable record with a brilliant possibility before it. In some few minor details it may require a readjustment and this readjustment will be made. While we are not living on

traditions, yet the traditions of any organization form a distinct asset in guiding it to future greatness, and the traditions of the Illinois Society augur most auspiciously.

The recent meeting, considering the proximity of the National Dental Association and the stress occasioned by the war, was most successful. There were nearly 500 in attendance and the interest throughout was sustained and even intense. The printed proceedings will show a program of exceptional merit, and the clinics were most interesting. All in all it was a creditable chapter in the society's volume, and it went far to disprove the pessimism of the early session.

For the 1919 meeting it is none too early to begin earnest work on the part of every officer and member. Never before was it so important that each man should give his loyal support to this grand old organization. War time conditions tend to distract the mind from dental association work, and it is therefore all the more necessary for the membership to concentrate on the problem of making the next meeting in every way worthy of the best traditions of one of the greatest dental societies in existence.

THE BLACK MEMORIAL.

At the meeting of the National Dental Association in Chicago in August there will be unveiled the monument to the late Dr. G. V. Black. The contributors to the fund for this monument come from every section of this country as well as from foreign lands, so that it may well be termed an outpouring of sentiment on the part of the whole profession, in commemoration of the love and esteem in which Dr. Black was held. It is a fortunate circumstance, and one which renders the entire proceedings very appropriate, that the chairman of the committee which raised the money for this monument is this year the President of the National Dental Association, and it would seem altogether fitting that it should fall to his lot to preside over the ceremonies which mark the culmination of this splendid achievement. Col. Logan has his plans well laid to make the event a memorable one in every respect, and the outlook is excellent for a most auspicious occasion.

We herewith publish an illustration of the monument as it

will appear. The figure will be of bronze with the base of granite, and the whole effect will be very imposing and life-like. The site selected is in Lincoln Park, a most appropriate spot for such a monument, and the memorial committee as well



GREENE VARDIMAN BLACK MEMORIAL.

*A Memorial from
The National Dental Association
To Be Dedicated at the Sixtieth Anniversary
Meeting to be held in Chicago
August 5-9, 1918.*

as the profession generally are thereby placed under deep obligation to the park Commissioners for their consent to locate the monument in this magnificent environment.

The attendance at the National Dental Association this year promises to exceed any previous meeting, and the outlook is very favorable for an epoch-making event in the history of dentistry.

BOOK REVIEWS.

ELEMENTARY AND DENTAL RADIOGRAPHY. By *Howard Riley Raper*, D. D. S., Professor of Roentgenology, Operative Technic, Materia Medica and Therapeutics at the Indiana Dental College, Indianapolis. With 523 illustrations. Second Edition. 502 pages. Published by Consolidated Dental Mfg. Co., New York.

Howard Raper never wrote an uninteresting line—at least if he did he carefully preserved it from print and probably threw it in the waste paper basket. Since the first edition of this work appeared the science of radiography has advanced materially, and in this advance Dr. Raper's book has been no small factor. The chief revision for the Second Edition takes the form of an appendix, a very interesting addition, be it said, to the volume. One of the most outstanding and valuable features of this appendix is the carefully formulated list of mistakes which are liable to be made in X-ray work. The author gives no fewer than 41 of these possible mistakes, and then says significantly: "It is incomplete, as perforce any list of mistakes in radiographic interpretation must be, for some one is making some new mistake every day." If every man who attempts to make or interpret radiographs would only study this list carefully it would add immeasurably to the value of X-ray work, and tend to materially lessen the errors which are constantly creeping into it. There are so many excellent ideas brought out in this book that to even enumerate them would carry us beyond the limits of a review. The advice is to read the book, study it, and then place it on the library shelf for future reference.

TECHNIC AND SCOPE OF CAST GOLD AND PORCELAIN INLAYS, with a chapter on endocrinodontia, or the ductless glands—their expression in the human mouth. By *Herman E. S. Chayes*, D. D. S., New York City. With 372 Illustrations. 392 pages. Published by C. V. Mosby Company, St. Louis, 1918.

The first 51 pages of this work are taken up with a dissertation on the "Sequence of Thought," which, while extremely interesting, bears little relation to the subject of inlays. The latter part of the book—pages 359 to 392—is given over to the subject of the ductless glands. Between these two in the body of the book there is a very comprehensive consideration of inlay work—both gold and porcelain. The author in his chapters on cavity preparation deals mostly in

illustrative description, a very effective method—in fact, the illustrations throughout the work are a prominent feature. Dr. Chayes, while discussing the indirect method of making inlays, comes out quite strongly in favor of the direct method, and in this we believe he will be endorsed by the majority of operators. The mechanical makeup of the book is beyond all praise. The paper and presswork are of the highest order, and, as has been intimated, the illustrative features are exceptional. It is a book which will prove very entertaining and instructive, and every dentist should own a copy.

HEALTH BY INSTRUCTION, An Effort in Favor of Biologic Teaching.

By *Dr. Luis Subirana*, Professor of the Dental School of Madrid. The English translation is by Frank J. Younger, D. D. S. Published in Madrid, Spain, by the Sociedad de Artes Graficas, 1918.

This is a book of 326 pages, written in the comprehensive style which is characteristic of the author. Professor Subirana is not new to authorship, having published several books, besides numerous pamphlets and magazine articles. The present volume will add much to his reputation as an author and a professional man, and what is of even greater consequence it will do much good to the profession and the public.

HOW TO KEEP WELL. A popular textbook on Oral Hygiene, descriptive and instructive. By *W. Nalencz-Koniuszewski*, D. D. S. For the benefit of the three million Polish speaking Americans. Chicago, Ill. Polish Peoples Publishing Co.

This is a book of 180 pages published in the Polish language, and calculated to instruct the Polish people in the important subject of oral hygiene. The reviewer is unable to pass on the merits of the text through lack of familiarity with the Polish language, but illustrations are appropriate and apparently well selected, and it is predicted that the work will do much good among the people for whom it is intended.

NINE HUMOROUS TALES, by *Anton Chekhov*. Translated from the Russian. Price 25 cents. Published by the Stratford Company, Boston, Mass.

This book is one of the "Universal Library" series, and con-

tains short stories by Chekhov, whose writings were held in high esteem by Tolstoi. When one thinks of the Russians, one does not ordinarily associate them with much that is humorous, and yet these tales deal almost wholly with the lighter veins of life, and throw a new side-view on Russian custom and character.

PRACTICAL HINTS

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Standardizing Laboratory Methods:—Wax models which reproduce the best anatomy of any tooth can only be consistently transmuted into identical gold inlays by standardizing your laboratory methods. Think this over carefully.—*C. H. Turnquist, Minneapolis, Minn.*

Pump Up Your Chair:—Always pump your chair up at night and hang the foot control up on the back pedal of the chair. By pumping the chair up, the janitor will give your office a better cleaning and the cord to the foot control will last longer.—*Y. E. Whitman, Little Rock, Ark.*

Chinosol in Root Filling:—Root canal fillings that are to be radiographed will have a denser outline if chinosol is incorporated with chloropercha and pumped into canal before inserting point. Chinosol being a good antiseptic is particularly indicated in canals that have been putrescent.—*Victor H. Fuqua, Chicago.*

Hardening Contact Point:—For several years Dr. W. D. Vehe of Minneapolis has been casting his gold inlays with a slight concavity at the contact point. Later this concavity is filled with twenty karat solder, which gives a contact point that will not flatten out, but will continue to function normally.—*O. D. Davis, Minneapolis, Minn.*

To Obtain Smooth Finish on Palatal Surface of Vulcanite

Dentures:—After case has been invested, separated and wax boiled out, paint the cast with liquid silic. Allow to dry thoroughly before closing flask. This eliminates the burnishing of tin foil, which tends to wrinkle and tear during the process, resulting in a rough and unsightly finish to that part of the denture.—*Lester N. Roubert, Chicago.*

Constant Pain in Bone:—Constant pain in one spot in the bone, lasting longer than a few days and most often found after removing impacted lower thirds, from the pressure of elevators, etc., means that that area of bone is undergoing necrosis. Treat by incising down to the bone at that point, and keeping packed open with iodoform gauze—changed every third day until the sequestrum separates—it may take four weeks.—*Earle H. Thomas, Chicago.*

A New Method for Making a Porcelain Crown:—The following described new method for making a porcelain crown will be found to be very practical for bicuspid and molar roots and specially adapted for short bite cases when a gold crown would not be desirable. Make a coping with one or two posts, according to the requirements of the case. Then, having the coping placed on the root, take an impression and a bite. Make models and adjust them in an articulator, then remove the coping from the model and solder a strip of gold plate around the coping on three sides, namely, mesio-proximal, lingual and disto-proximal, having the gold strip wide enough to reach to, or nearly to, the occlusal surface of the crown as it will be when finished. Then having selected a facing of the proper shade and size, solder the pins of the facing to the post of the coping. Then make a mix of synthetic porcelain of shade to match the facing and fill it in upon the coping, which, having three side walls of gold and the facing as a buccal wall, sustains the synthetic porcelain at every point. While the synthetic porcelain is soft, carve it to an approximal occlusion with the antagonizing tooth in the articulator and when fully hardened grind and polish the porcelain to a proper occlusion.—*H. A. Cross, Chicago.*

MEMORANDA.

PHOTOGRAPHS MISSING.

Dr. G. H. Henderson, librarian of the Illinois State Dental Society, has done a notable work in gathering all of the bound transactions of the society from the beginning. He has also secured the photographs of all the officers except three, Drs. Truesdell of Elgin, C. O. Dean of Mount Carroll, and W. W. Ormsbee of Geneva. Members of the society are requested to assist Dr. Henderson in securing these photographs to complete the list. The transactions and photographs will be on exhibition at the National Meeting in August.

ENTIRE DENTAL CLASS ENLISTS.

If the teeth of the boys in the army are not kept in good repair, it will not be the fault of the 1918 class from the College of Dentistry at the University of Minnesota. Every member of the class has enlisted in the Medical Reserve Corps of the Army and are to be called to the training camps upon graduating from the school about June 15, according to Dean Alfred Owre. This means that between ninety and one hundred "dents" will be inducted into military service upon graduation. They will be given the rank of privates. A statement from Capt. Sumner White, head of the Sanitary Corps of the Army, indicates these men with others from other colleges will be called into service immediately.—C. T. Burnley, 894 Hastings Avenue, St. Paul, Minn.

ALABAMA DENTAL ASSOCIATION.

At a recent meeting of the Alabama Dental Association, the largest and most interesting Clinic of the kind ever held was given.

Dr. Geo. B. Winter of St. Louis gave a Clinic of removing impacted lower third molars. Col. Wm. A. Squires, the head of Camp Sheridan Dental Corps and a member of the Committee on Arrangement, secured a number of patients from the Camp for the Clinic. We also had some civilians for patients. Dr. Winter removed about thirty impacted teeth during the day. Dr. Boyd S. Gardner of St. Louis came here a week before the Association and radiographed all the cases. Dr. Gardner is associated with Dr. Winter.

There was an actual attendance of over two hundred and fifty dentists and unquestionably all of us doubted the reports that had reached us that Dr. Winter could remove these teeth on an average of one minute, or we thought he picked his cases. But he gave us a surprise. He did not pick the easy ones, but took them as they came, and two of these were as difficult cases as could be found. Several others were completely incased in the bone and no part could be seen until the bone was removed. His time for the day was kept by two stop watches in the hands of doubters, and their record shows a fraction over fifty-one seconds per case.

Undoubtedly the technique developed by Dr. Winter far surpasses anything heretofore given in this work. Dr. Winter preceded his Clinic by an instructive talk on Exodontia with slides showing every condition met by anyone engaged in the practice of dentistry. He has undeniably done more than anyone in the profession in elevating this branch of dentistry from "tooth pulling" to a scientific surgical operation.

CHARLES F. CHANDLER, President.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

NOTES AND NEWS.

COMMUNICATION FROM PRESIDENT BEACH.

The Third Annual Meeting of the League will take place in conjunction with the meeting of the National Dental Association on August 7th, 1918.

We are preparing a program of unusual merit and, on account of the great work which has been done by the League during the past year, a general report will be given which will cover the several activities we are engaged in.

Addresses will be made by prominent men on subjects appropriate to the occasion and during the sessions of the Convention, meetings of State Directors and general workers for the League will be held for the purposes of instruction and stimulation of interest.

WHAT THE PUBLIC SHOULD KNOW.

Many drafted men apply to the dentist with the idea that the Government is paying for our services and that they have a right to demand expensive bridgework and other attention without limit. This has come about because of the semi-military procedure of sending the notices on cards franked by the War Department. Considerable embarrassment at times, has been caused the dentist and all local workers are justified in using legitimate means to acquaint the public of this misconception. It is also most essential that the public understand that all service given in the name of the League must be absolutely free. Accepting the smallest compensation aborts the spirit of the League and cannot be justified.

Our members have been asked to give each drafted man one hour of free service and whatever one chooses to give beyond that, the League is, of course, glad to receive. If it is deemed unwise to give additional service without fee, the patient should be discharged as having received that which is due him from the League, or advised to appeal to League Headquarters for assignment for further attention.

LEAGUE BUTTONS.

We again urge all members to wear the League button as an indication that they are actively engaged in preparing our drafted men for service. Those not having the button may secure one by sending twenty-five cents to the Treasurer, Dr. L. M. Waugh, 576 Fifth avenue, New York, N. Y.

THE LEAGUE STUDY COURSE.

The League study course is designed for the mature practitioner to prepare him to give adequate service to our soldiers who have been injured in battle. Many thousands will return needing our best care, therefore, it is our duty and privilege to give every assistance possible in this direction. The course will be practical in character and approved by our best authorities. Information may be obtained by addressing the office of the President, 131 Allen street, Buffalo, N. Y.

LANTERN SLIDES.

The League has prepared 25 sets of slides which have been distributed to the different State Directors to be used by Sectional Units and Dental Societies in general. The public also may find much of interest in viewing these pictures. Each set is practically divided into two parts, one set arranged by Major Heckard, comprising nearly 90 slides, and traces the plans and development of the great work of caring for the drafted men. The evolution of the different form cards together with their application is graphically depicted and is of especial benefit to Directors and members of the League generally. Every District Director should show these slides to his workers.

The second set of about 35 slides was arranged by J. W. Beach and aside from conveying general information of the League and its work, gives special emphasis to the wonderful Dental Motor Car of the League in a series of most interesting pictures. These are available through the State Directors. There is a lecture in synopsis form accompanying each set of slides.

J. W. BEACH.

COMMUNICATIONS FROM DIRECTOR GENERAL TO STATE DIRECTORS.

I am enclosing copy herewith of the report prepared by Major Heckard up to May 1, 1918.* This will give each State Director an opportunity to see just what has been done in his State up to May 1st.

The grand total for the United States is 236,115 operations. This is a fine showing, but we are going to make it 1,000,000 operations.

Don't criticize the states that have a small number of operations reported. Their required quota may not have been as big as yours and then, too, some states have only recently got started. Just watch the reports from now on and see them grow.

In a few days we will send you a report of the work done to June 1st, and thereafter each month. There's a big surprise coming in that June report.

The dental profession is going on record. Our part in winning the war is to make our boys dentally fit. Let's push that 1,000,000 operations "over the top." See if you cannot do two things: First, secure 100 per cent of the dentists in your State as members of the League; and second, secure the co-operation of members to send in reports. Application blanks in any desired quantity will be forwarded to you upon request.

The enclosed report is nothing like as large it would have been if a Form 3C Card had been returned to our Headquarters at 50 East 42d Street, New York City, for every operation. Unfortunately, many men do not see the necessity of making these reports and I feel sure that at least 150,000 operations have been performed of which we have no record. If, therefore, you want your State to make as good a showing as possible, it is essential that you impress upon all members of the League in your State through your County Directors the necessity for returning a Form 3C Card to our Headquarters for every operation performed.

With the German U-Boats at our very doors let our profession give its answer—More sacrifice for ourselves—More help for our boys.

Major Heckard, who has been so untiring in his devotion to the work of the League, will leave our Headquarters on June 11th, and proceed to Camp Greenleaf, Fort Oglethorpe to prepare himself for special services in another field of activity in the Dental Reserve Corps. His loss to the League will be greatly felt by everyone, particularly at Headquarters, and I am sure the best wishes of all our Directors will follow him in his new field of action. We need your co-operation more than ever, and bespeak for his success, or when appointed the same hearty co-operation which has been accorded Major Heckard.

Yours very truly,

CHARLES F. ASH,

Director General for the United States.

COMMUNICATION FROM MAJ. HECKARD.

I am in receipt of your communication of June 7th congratulating me on the change I am making, and asking that I write "a short good-bye letter to the boys of the League, for publication in the Magazines." I will make it read "members" because there are a good many women dentists giving Free Dental Service.

At this time I can simply state that my request to be relieved of the supervision of the Preparedness League of American Dentists and assigned to further Military Duty having been granted and before I report to the Officers' Training Camp, Camp Greenleaf, Chickamauga Park, Georgia, I

* Tabulated statistics too complicated for publication.—ED.

would like to thank the officers and members of the Preparedness League of American Dentists and all other persons who helped to make Free Dental Service possible for the men of our New National Army.

I do not consider this work much more than started although we have reported at this office nearly 400,000 operations to date. I feel confident that with the same co-operation and support which has been given me, continued, the League will very soon be able to report 1,000,000 free dental operations.

I hope the day is not far distant when every American Dentist will be a member of the Preparedness League of American Dentists.

Fraternally yours,

W. A. HECKARD.

COMMUNICATION FROM CHAIRMAN OF MOTOR CAR COMMITTEE.

In order to get the Dental Motor Car project properly before the Dental profession and give them an idea of what has already been done in the way of the first models, I am asking the Editors of all the magazines to publish the following statement:

It has been arranged by the Chairman of the Dental Motor Car Committee to have sent to any person interested in Dental Motor Cars sets of photographs showing all details of the Car direct from the photographer at the following prices:

1 Set 10 Plain Prints	\$2.00
1 Set 10 Linden Prints	2.50
1 Set 10 Lantern Slides	5.00

Send to the following address for these photographs:

Harry C. Beitt, 12970 Emerson Ave., Cleveland, Ohio, Commercial Photographer.

Respectfully yours,

S. M. WEAVER.

REPORT FROM OKLAHOMA.

The following is a report of the Oklahoma State Dental Director of work performed by Oklahoma volunteer dentists:

The State organization committee is as follows: Dr. T. W. Sorrels, Oklahoma City, Okla., Chairman; Dr. H. R. Watkins, Guthrie, Okla., Vice-Chairman; Dr. Emma Fountaine, Oklahoma City, Okla., Secretary; Dr. A. B. Potter, Oklahoma City, Okla., Treasurer, and Dr. J. M. Temples of Tulsa, Okla., and Dr. N. C. Wood, Ardmore, Okla., as Finance Committeemen.

Each county has a local director of dental activities working under the direction of the State Director.

The dental profession is well represented on every Medical Advisory Board in the State.

The Adjutant General and State Director with the 89 Local Selective Service Boards and 77 County Directors of dental activities are closely co-operating and working in absolute harmony.

The Finance Committee went over the top—is raising sufficient money to handle executive details and provide for clerical assistance, printing, etc. It was done by popular subscription and limited to the dental profession of the State. An appeal was made to each County Director to solicit the dentists of their respective districts.

The remaining 15 per cent of the first draft, which were sent to their cantonments on February 24th, were made as near dentally fit as was possible.

One hundred and fifty-five dentists have mailed in the volunteer service cards to State Office and many others volunteering to their County Directors. A wonderful spirit of patriotism and a general willingness to assist is strongly manifest. Much work has been accomplished and Oklahoma in proportion to

its size and number of men in the dental profession will stand near the top in the list of States.

Having just recently received the outline of procedure and necessary supplies we are now in a position to do real effective work. There is every reason to believe that the results accomplished in the next draft will be more than gratifying.

Respectfully submitted,

T. W. SORRELS, Director for Oklahoma.

R. OTTOLENGUI, Director of Publicity.

THE PARIS "CHICAGO HOSPITAL" FOUNDATION, INCORPORATED UNDER THE LAWS OF THE STATE OF ILLINOIS.

The plan to build a Memorial Hospital in Paris—a tribute to the Nations whose sons have fought together for Freedom—has materialized, and the building is to be called the "Chicago Hospital."

We are sure there is not a citizen in Chicago or Illinois who will not feel a source of pride in this plan, which is to be carried out immediately after the cessation of the war. To ask one thousand citizens, each, for a gift of one hundred dollars, or a hundred-dollar Liberty bond (or, this amount from any group of citizens), does not seem too grasping when we consider the appeal made upon our sympathies due to the appalling destruction to France and to its people. What ground does this appeal not cover in our obligations to this heroic country? We do not mention this nation as the only one to suffer among the Allies, but the one on whose ground the decisive blows are to be struck and where destruction can but continue up to the moment of victory. And when the war ends it will leave in its wake an appalling need in the way of attention to numberless crippled soldiers, wounded men, women and children, due to air raids and other atrocious attacks.

A thousand and one illnesses have arisen from the privations and hardships endured while the conflict has continued. There are 800 French tuberculars interned in one Swiss town alone. These were sent back from the German prison camps. Many have died after reaching Switzerland. Those still alive may look strong and well, but they are not. To quote an article in *The Outlook* of December 5th, 1917:

"They are all human wrecks. No stomachs, no nerves, no lungs, no digestion. After a year or two of German prison-life, with hunger, cold, hardship, and deliberate cruelties and abuse, they are querulous, contrary and upset in every way. They cannot concentrate. Those who take up University courses are surprised at the way their minds will not work and cannot be kept on abstract things, after so many months of brooding on their personal grievances and hardships, and the mere animal question of food. They may look fit, but take them into an office and let them lean over a desk for a few hours and they break down, have fever, and go all to pieces."

If there are 800 in one town, think of the numberless souls who will return to Paris from Switzerland, Holland, Belgium, and the invaded districts of France! We have but to read of the incredible number of hospitals in France today, necessitated by the war, to judge of the call on human sympathy when the war-hospitals close, and these victims—under-fed, anemic, nervous, human wrecks—return, and must be cared for and brought back to life. And those of us who have remained in comfort during these terrific years MUST give them care, and not only bring them back to physical life, but to all else that we can give.

The Red Cross and other war-relief associations are doing marvels in this line, but the urgent needs of the moment must, of necessity, come first and leave numberless victims with but slight, if any, attention. There are a million little orphans in France today. We know of the food restrictions of

wartime and we must appreciate the greater exertions necessary after this conflict, to help build these little frames into strong and robust men and women. The future of France and of the allied countries lies in its children. But children, alone, cannot face the problems of life. Those men and women who have lived through this war, and who will need care at its close, must find care and medical attention.

No better place can be chosen than Paris, the center of France, and we feel sure all those who can subscribe to this fund, or help us, will give us their hearty co-operation.

One Memorial Room has been donated in this Chicago Hospital to the late Dr. Henry Baird Fayill. We feel no more appropriate place will be found for a Memorial to our young war-heroes than the Chicago Hospital in France.

Checks or bonds may be delivered to the Peoples Trust and Savings Bank of Chicago for the Paris Chicago Hospital Foundation (of which Mrs. Archibald Freer is the founder and present Treasurer).

COLLEGE COMMENCEMENTS.

VANDERBILT UNIVERSITY SCHOOL OF DENTISTRY.

Graduates: R. L. Anderson, J. C. Austin, E. W. Bacon, J. F. Baldwin, A. H. Bartling, I. W. Bull, W. P. Caine, J. W. Campbell, M. J. Clark, J. R. Carlton, R. Cole, E. M. Cuenod, C. A. Daniel, C. E. Ellis, W. T. Foster, C. M. Gilbreth, T. H. Harris, Jr., G. K. Harmstead, H. D. Harper, M. S. Howard, W. H. Howard, Jr., J. B. Hurt, A. S. Ingman, Jr., M. L. Jarrell, A. X. Lawrence, L. E. Linebaugh, H. B. Love, C. E. Mathis, E. J. Mahoney, W. M. McAnally, R. R. McDaniel, H. T. McGlothlin, M. L. Naramore, W. W. Petty, J. B. Price, R. J. Redman, C. F. Sowell, V. A. Stilley, Jr., E. H. Taylor, T. L. Thomas, F. C. Ulen, J. M. Vick, M. Winton, F. R. Woodward, F. L. Tapia, Jr., N. L. Norman.

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Graduates: B. R. Adams, C. A. Anderson, W. R. Brown, F. W. Buchanan, C. L. Buckner, A. E. Case, W. E. Casey, A. B. Chalmers, J. A. Corman, C. A. Crabb, J. D. Crowder, H. M. Culver, C. J. Cundiff, L. C. Eberhart, F. C. Elliott, W. H. Euler, I. S. Evans, R. L. Fox, H. S. Fulton, M. P. Gardner, F. M. Garrett, A. H. Gilfillan, L. H. Gilley, L. D. Gray, L. Hamilton, S. C. Hamilton, M. Hardenbrook, L. B. Hill, P. B. Hoffmann, E. G. Husband, R. B. Ingram, F. M. Jamar, R. E. Jacques, J. B. Jenkins, R. D. Jordan, C. G. Kehl, H. L. Kells, T. P. Keyes, L. R. Kramer, R. O. Lane, E. H. Lentz, G. H. Lewis, W. T. Longwell, A. W. Lyon, V. C. Medcalf, E. Moe, L. E. Morrow, C. B. Myers, J. F. McCarty, C. M. McCue, J. R. McDonald, E. D. McEwen, R. A. Olson, M. S. Otten, J. E. O'Donnel, V. L. Overstreet, A. L. Pickard, W. M. Pugh, R. G. Reed, R. M. Sansom, L. D. Shain, F. A. Smith, I. T. Stewart, J. J. Sullivan, G. L. Teall, Dr. M. Wakui, P. T. Williams, E. Whitney, L. F. Whitson.

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H. EDMUND FRIESELL, D.D.S., DEAN.

Graduates: P. W. Allen, E. LeR. Ambrose, P. R. Ashbrook, E. E. Atkinson, J. L. Barton, R. A. Bastress, C. O. Bischoff, E. M. Breed, H. F. Bristol, D. M. Boies, J. L. Boots, G. L. Cavanagh, E. B. Clark, C. W. Conn, E. S. Coombe, A. J. Cross, H. M. Covert, W. E. Craig, P. H. Deffenbaugh, E. P.

De Haas, F. L. De Hart, M. W. De Hart, S. W. Diller, Jr., L. I. Diss, E. B. Fast, H. E. Feters, A. L. Finlay, J. E. Franklin, J. E. Gestner, L. Goldstein, R. S. Halpin, F. E. Hamilton, E. F. Hartley, R. A. Hayes, J. A. Helfenbine, F. E. Henry, G. A. Hoop, R. K. Igo, S. M. Johnson, C. A. Johnston, S. L. Kalinowski, R. Kaplan, W. P. Kennedy, W. A. Kern, O. Kesel, F. L. W. Kuhlman, I. Levy, A. C. Lindberg, R. C. Lutz, F. M. McCarthy, W. D. McClelland, H. D. Miner, J. W. Mitchell, H. W. Moore, F. L. Morse, J. V. O'Donovan, F. J. Owens, L. H. Peterson, J. C. Pillow, L. B. Riggs, C. A. Robinson, C. W. Rogers, S. H. Rosenthal, E. B. Rotheram, J. W. Scott, E. D. Shumaker, J. W. Sigafos, M. Snyderman, B. C. Sproull, H. McC. Steele, J. I. Steele, C. S. Stitt, H. H. Stoops, J. E. Stuart, J. B. Sutherland, R. McD. Swank, T. M. Taylor, P. N. Teare, L. B. Thomas, J. A. Thompson, V. B. Weber, L. E. Weekley, H. E. White, D. L. Young.

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Graduates: E. E. Akan, G. W. Akerly, R. D. Anderson, H. Arai, G. Ardery, D. H. Ascher, J. M. Barker, M. C. Baron, S. Barton, E. Baum, M. D. Baxter, P. Bazer, F. Berg, L. G. Bennett, W. K. Bingaman, G. W. Blaha, J. C. Bolin, C. E. Bollinger, C. H. Brandau, A. O. Brehm, M. D. Bringham, D. P. Broadbent, V. J. Brookes, A. C. Brown, W. N. Brown, E. J. Butler, W. Calkins, H. C. Carlson, R. A. Case, M. Caslow, C. E. Chamberlain, K. L. Chang, H. P. Chapman, G. W. Christoph, C. Clarno, E. W. Clusman, A. G. Coplon, G. Crabtree, C. B. Crouch, L. Dannewitz, H. L. Davis, S. Demski, R. Denholm, A. C. Doe, H. L. Dorland, M. N. Duxbury, B. Dvorkin, F. Dyson, A. H. Finke, F. G. Fisher, T. G. Fisher, E. R. Foutz, E. C. Fox, H. Freidinger, J. Garcia, J. C. Gedstead, L. Goldstein, C. A. Goode, S. Gordon, M. H. Gouse, C. G. Green, J. W. Green, S. Greenberg, M. Greenstein, P. F. Grimm, J. A. Grinde, E. N. Hahn, H. E. Hanson, R. P. Hanson, J. D. Hardin, F. S. Harris, C. M. Haug, O. A. Helmer, J. O. Hitz, J. Holtz, D. L. Horton, J. Y. Hurdle, F. A. Hussey, K. Ikeda, F. A. Jana, A. P. Johnson, E. M. Jones, W. E. Jones, M. B. Kane, M. M. Kaplan, I. I. Kaplin, C. H. Kellam, F. O. Kimble, P. C. Knoppe, A. J. Koch, S. A. Kowen, L. Kudulian, M. E. Landis, A. R. Lauraitis, L. N. Lee, A. S. Lepak, M. L. Levin, W. Levin, L. Liberfarb, M. Lipschutz, B. J. Lundahl, L. T. Maas, B. Mach, C. Maetzold, F. B. Mahan, J. A. Marshall, J. J. McCarthy, M. McMillin, L. H. Mendoza, C. Merrihew, B. Miller, M. O. Mortrude, G. Murphy, C. M. Musser, N. Nechtow, J. E. Nelson, W. A. Niemi, H. O'Dell, G. R. Olfson, F. J. Padt, W. Parr, B. Pawlowski, L. Postiglione, L. Quint, J. Raklewicz, S. Rakow, J. Rasmussen, H. A. Reid, W. D. Rice, J. J. Reilly, H. E. Roberts, J. P. Robinson, J. Robinson, K. H. Robison, B. Rodin, B. J. Rosenthal, L. N. Roubert, N. R. Rubin, M. Saito, T. F. Salisbury, L. T. Sanborn, A. A. Savage, H. Schaefer, C. Schlosberg, O. Schnitzer, M. Seidenberg, R. G. Sewell, E. Shefte, H. Shields, B. Siegel, B. Siml, H. Singer, G. B. Skinner, T. A. Skinner, H. Skolnik, W. L. Spencer, S. Spira, A. H. Stein, R. R. Stewart, H. D. Stokes, N. A. Stone, R. J. Stone, C. L. Straith, P. D. Straup, E. Stupka, N. Tacij, I. Tashiro, C. Tesche, F. Thompson, R. A. Thorpe, I. Trossman, E. F. Trost, R. A. Trovillion, F. Turnbaugh, L. M. Venable, G. H. Waldron, C. H. Walker, E. H. Wallace, J. J. Warczak, J. T. Warner, O. M. Weber, H. Weinfeld, G. R. Weisz, F. A. Wertz, A. Wilson, J. M. Whitney, L. Wineberg, V. M. Winter, E. Wojahn, J. Wojtalewicz, M. R. Woolley, J. C. Yates.

PATENTS OF INTEREST TO DENTISTS.

1163196. Dental pliers, Edward H. Angle, New London, Conn.
1163197. Orthodontia appliance, Edward H. Angle, New London, Conn.
1162970. Dental grinding wheel and mandrel therefor, Edgar P. Binford, Chicago, Ill.
1163319. Fountain tooth-brush, Wm. O. Campbell, St. Louis, Mo.
1163074. Interchangeable tooth, Israel J. Fink, Cleveland, Ohio.
1163141. Artificial tooth, Thomas F. Glenn, Ardmore, Pa.
1162941. Hygienic protector for dental handpieces, Louis L. Martin and R. A. McTavish, Toronto, Ont., Can.
1164475. Automatic mallet or plugger, George Croston, Hoquiam, Wash.
1164597. Tooth-brush, Roy A. Darling, Pellston, Mich.
1164599. Crown tooth, Adelbert Fernald, Boston, Mass.
1165149. Matrix device, Frederick J. Bonnalie, Chester, England.
1164987. Method of and apparatus for projecting Rontgen images, Gustav Bucky, Berlin, Germany.
1164997. Dental amalgam, Thomas J. Davis, New York, N. Y.
1164715. Dental tool, Carl M. Hedmen, Chicago, Ill.
1165937. Dental flask-closing device, Robert Booty, Toronto, Canada.
1165964. Anchor for artificial teeth, Gustav E. Fritz and T. G. McMahon, Chicago, Ill.
1166269. Tooth-brush, Hallie M. Smith, Bedford, Ind.
1166033. Dental chip-blower, Frederick S. Yoder, Wernersville, Pa.
1167353. Anesthetic apparatus, Albert C. Clark, Chicago, Ill.
1167341. Mechanism for upsetting heads on fastening pins for artificial teeth, Karl Finckh, Berlin, and P. Almstedt, Berlin-Baumschulenweg, Ger.
1167062. Dental saliva-ejector, Ferdinand Groshans, Baltimore, Md.
1166766. Orthodontic appliance, Harry E. Kelsey, Baltimore, Md.
1166462. Breath deflector, Thomas J. King, Richmond, Va.
1166924. Rubber dam clasp, Freeman H. Newlin, Huntingdon, Pa.
1166796. Anatomical mannikin-head, Faneuil D. Weisse, New York, N. Y.
1166732. Dental floss holder, Denis K. Woodhouse, Chicago, Ill.
1168052. Dental instrument, Wm. W. Bolls, Washington, D. C.
1168212. Apparatus for swaging seamless crowns, Gailord M. Hiner and L. L. Hidy, Jeffersonville, Ohio.
1167833. Tooth-brush holder, William Metzroth, Syracuse, N. Y.
1168842. Pad for headrests, Bela Albrecht, New York, N. Y.
1168998. Tooth cleaner, Clyde K. Brandenburg, Klamath Falls, Oregon.
1168635. Dental-material condensing apparatus, Jephtha G. Hollingsworth, Kansas City, Mo.
1168965. Fountain tooth-brush, Esther Rosenblum, Los Angeles, Cal.
1168911. Dental instrument, Alexander Schutt, Bismarck, N. D.
1168574. Lip-retractor, Frank Spurr, St. Paul, Minn.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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PREVENTIVE DENTISTRY.*

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Preventative dentistry, the science of the hour, has not been considered of sufficient importance either to the medical men or to the laymen until scientists have proven at this late hour, by investigations which have been statistically reported, that many of the diseases of the body have been the result of disease-producing organisms in an unclean mouth. Physicians and the public in general have not yet learned that an unclean mouth is a very prolific, if not the most prolific source of danger to the health of the individual of which we have any knowledge.

Hygiene of the mouth must deal not only with the question of cleanliness but also with diseased conditions and their prevention. An unclean mouth leads to the decay of the teeth which in turn, if neglected, leads to dental alveolar abscesses which may result in acute septicemia. Another diseased condition of the unclean mouth may produce gingivitis, which usually leads to pyorrhea and the final loss of the tooth. Other diseases resulting from an unclean mouth are stomatitis, pharyngitis, tonsillitis and the inflammation and infection of the maxillary sinus.

Dental caries is, without doubt, the most common disease that effects the human family at the present time, and from which very few persons wholly escape. Investigations made among a large number of school children, army men and employees of manufacturing plants, show that many of the physical ailments were due to the poor condition of the teeth and neglect of the oral cavity. The result was, that the resistive powers were weakened and various diseases encroached upon the body. Many of the commercial firms have recognized this fact and have equipped

*Read before the Howe School Mother's Club, Chicago.

a dental office and employed one or more dentists to examine and treat the mouths of their employees. The International Harvester Company, Montgomery Ward & Co., the Western Electric Co., Chicago Telephone Co., Firestone Tire & Rubber Co., and other firms have adopted such a plan and it has proved to increase the efficiency of their employees.

The care of the mouth cannot begin too early in life. As soon as a baby begins to take food, its mouth should receive attention. The uncared for mouth of the growing child is never free from particles of coagulated and fermenting milk, which are the soil upon which many forms of harmful micro-organisms grow and flourish. The result is stomatitis, which can only be prevented by keeping the mouth clean. This can be done by wrapping a piece of sterilized cotton which has been saturated in sterile water around the index finger, and inserting the finger over the surfaces of the mouth, gums and tongue. As soon as teeth appear they should be kept scrupulously clean.

Before we consider further the care of the teeth, it is necessary to have an understanding of the development of the dental apparatus. The normal denture must be understood before one can recognize the abnormal denture. Time will not permit of the consideration of all deleterious effects from malocclusion, but we consider briefly those conditions which every mother should understand and recognize in the development of her child's teeth.

Twenty years or more are required by nature to build the human denture. Unfortunately during this time few individuals are free from disease or accident. The normal development of the body as a whole or in its individual parts is more or less impaired during this period. That part of the human body which is known as the dental apparatus is also at this time more frequently at variance with the normal development as evidenced by the fact that malocclusion of the teeth in some form is almost the rule rather than the exception. We are better able to understand the reason for this, when we understand that the dental apparatus is not an organ with a single function like the eye or the ear, but a very complex structure with many functions. The dental apparatus not only includes the teeth, the jaws and the dental arches, but also the muscles of mastication, the lips, the tongue, the nasal passages, the palate and the throat. In addition

to the function of mastication these parts are also involved in the vital function of respiration and in all facial expression.

In deciduous dentition malocclusion is seldom found as the foods and habits of the child are simple and normal. The teeth have no interference in their eruption from any remnants of previous teeth, which are so often the disturbing factor in the permanent dentition. The exfoliation of the deciduous teeth through the absorption of their roots is a physiological process and it should take place normally and without interference. Nature not only provides the deciduous teeth for the important function of incising and masticating the food required by the child up to the normal period of the loss of these teeth and the replacement by the succeeding permanent teeth, but also assists in a mechanical way in the development of the alveolar process and the development of the jaws.

The permanent teeth being larger and more numerous require more space which is provided by the broadening of the dental arches in the region of the cuspids and by the lengthening of their lateral halves posterior to the deciduous molars. This broadening and lengthening is influenced to a great extent by the development and eruption of the permanent molars. If the deciduous molar is retained until the eruption of the first permanent molar, the tooth, if a lower, will take its position in the arch posterior to the second deciduous molar, forcing its way between the second deciduous molar and the ramus of the jaw. If an upper molar, it will force its way between the second deciduous molars and the maxillary tuberosity. At the same time the deciduous teeth are carried forward and thus the alveolar process is lengthened mesio-distally. However, if one of the deciduous molars is lost, this wedging process incident to the eruption of the first permanent molar will be lost, and that part of the jaw will be shorter than normal.

Probably the greatest harm results from the premature loss of the second deciduous molars and cuspids, yet the principle we have been discussing applies to any of the deciduous teeth, the difference being only in degree. The mechanical influence of the deciduous teeth in the dental arches is so important that they should always be retained up to their normal period. If affected by caries they should be restored by proper fillings.

Never allow the decay to progress to such an extent that it is almost, if not quite, an impossibility to place such fillings. After much experimentation and observation copper cement has been found to be the most efficient filling material for deciduous teeth. This cement if properly placed usually lasts as long as the deciduous teeth remain in the mouth. It is also more easily and more quickly manipulated in the mouth of the child than any other filling material.

What has been said of the mechanical influence of the eruption of the deciduous teeth applies also to the eruption of the permanent denture up to the period of their complete eruption. If one or more of the permanent teeth anterior to the permanent molars is extracted or lost through accident, the wedging process so necessary to the development of the arches serves only to close the space thus made, and there will be no carrying forward of the teeth. Again there results an unequal development of the two arches and the consequent malocclusion of the anterior teeth.

There is an interdependence of the teeth at all times. The loss of one or more teeth at any period will have a marked influence upon the remaining teeth. As soon as a tooth is lost it should be replaced by an artificial substitute to retain the normal relation of the remaining teeth. Prior to our present knowledge of malocclusion, its causes and its effects upon the growing child, it was a common practice among dentists to extract certain teeth to correct malocclusion. Invariably the result of such practice is worse than to allow the malocclusion to take its course, for this condition may be bettered not by extraction but by correction of the malposition by orthodontic procedure.

Examples of such practice are numerous and many case histories could be cited. However, I wish to bring to your attention one such history. A seventeen year old girl, a junior in high school, was referred to the College of Dentistry by a physician. This girl was thin, anemic and dejected. Upon examination of the mouth the first condition that startled me was swollen, inflamed dark red bleeding gums. The cause was apparent. There was a bridge in the upper part of the mouth extending from the last molar on one side to the last molar on the opposite side. In the lower part of the mouth there was a bridge

on either side involving the molars and bicuspid and three of the anterior teeth had been crowned. This girl said that she had not been able to eat anything but soups and broths for two months, and had not closed her teeth for the same period without excruciating pain. Upon further inquiry it was learned that when a child, her dentist had extracted the upper cuspid teeth because they were malposed. A year or two later the other anterior teeth became malposed. This was due to the abnormal space resulting from the extraction. The bicuspid teeth also moved forward for the same reason and in all probability the molars shifted likewise, but this could not be learned. All of the teeth in the upper arch having shifted into malposition it was thought advisable by the dentist to extract more teeth and by bridge work supply the missing teeth. These bridges failed to be comfortable and to function satisfactorily. Consequently the several bridges were removed, more teeth extracted, and a continuous bridge placed in the upper part of the mouth. Such an extensive bridge improperly constructed and with an insufficient number of tooth roots as piers produced the results in the mouth as described. The diagnosis was self evident and the indications for treatment were clear. The bridge was removed, all remaining tooth roots were extracted and as soon as possible an artificial denture was substituted. This was a clear cut case history. The extraction of the malposed upper cuspids, the consequent malposition of the other teeth and the necessity for extensive bridge work, the final extraction of the remaining teeth and the wearing of a full upper denture at the age of seventeen took place within a period of a few years. Of course, this is an extreme case but it shows conclusively the danger of extracting teeth for the correction of malocclusion.

For some reason or other the normal absorption of the roots of deciduous teeth is sometimes delayed and the succeeding tooth will either be prevented from erupting or it will be deflected into malocclusion. Deflections may also occur from a small portion of a remaining tooth. When the indications are clear that a deciduous tooth is actually interfering with the eruption of its successor, it should always be removed to allow the correct placement of the erupting permanent tooth. Usually the absorption of the deciduous tooth and the eruption of the permanent tooth

occur simultaneously. It is the exception rather than the rule to extract deciduous teeth prematurely as it interferes with the normal process of development. Occasionally a tooth fails to erupt and remains in the alveolar process for a long period. The space is then partially or wholly closed by the wedging process of the adjoining teeth. This produces an impaction. If later this tooth begins to erupt it must necessarily force the adjoining teeth into malocclusion or erupt itself into a malposition. In either case the condition can be avoided if it be recognized. Appliances may be placed on the adjoining teeth so that they are held apart until the tooth in question comes into its place in the arch.

Supernumerary, or extra teeth, above the normal number of thirty-two, are not uncommon. Usually they are pegshaped teeth and although they may occur any place in the dental arches, the more frequent location is either between the central incisors or in the region of the laterals. When supernumerary teeth are found, that region of the mouth should be X-rayed. If the normal teeth are found to be developing, this abnormal tooth should, of course, be extracted so as not to interfere with the normal teeth.

The habit of sucking the thumb, lip or tongue so frequently formed by young children rarely causes displacement of deciduous teeth but if continued during the eruption of the permanent incisors it will cause marked malocclusion. The upper anterior teeth are drawn forward and to one side or the other, this depending upon whether the right or left thumb is used. The pressure from the back of the thumb causes the lower incisors to be displaced lingually. Such habits are difficult to overcome, but unless the child is broken of the habit, malocclusion is usually the result. The correction by orthodontic procedure is likewise more difficult or impossible until the habit is broken.

Mouth breathing is the most constant cause of malocclusion. It is most prevalent between the third and fourth year which is the most important period in the growth of the dental apparatus. Its influence is felt indirectly upon the teeth by causing abnormal development of the muscles of the face, the bones of the nose, and the jaws, and the derangement of the lips, the cheeks and the tongue. The extent of this derangement depends upon the degree of the mouth breathing and the length of time it has been practiced.

From being a mouth breather the child gets insufficient oxygen, becomes anemic, listless and loses weight. The lungs lack normal expansion, and the child becomes flat chested or pigeon breasted. Thus weakened a predisposition to pulmonary and other diseases is established. The causes of mouth breathing are many but are always pathological, usually being a nose or throat disturbance. A nose and throat specialist should be consulted at once. If adenoids, enlarged tonsils, or any abnormal growth in the nasal passages are found, they should be removed as soon as possible.

The question is so frequently asked, "When is the proper time to have my child's teeth straightened?" As soon as one can recognize the malposition of a child's teeth is the time to consult an orthodontist and have the correction begun. Frequently a parent of a child begins to worry about the crooked teeth too late rather than too early in life. The earlier an orthodontist begins the correction the better the result.

Having considered the necessity for the care of the deciduous teeth and the eruption of the permanent teeth let us now further consider the care of the permanent denture. This care, primarily, is the consideration of all those means which may be employed to prevent caries of the teeth and diseases of the mouth, and secondarily of those means which may be employed to cure the disease and restore the lost parts. The cleanliness of the mouth and the teeth is the greatest of all prophylactic measures which can be instituted against dental caries. The value of perfect oral cleanliness is not generally understood or appreciated by the public. Many individuals who are aware of such a necessity are unable to get the desired results because of a lack of knowledge of the parts involved. It, therefore, becomes the duty of every dental practitioner to instruct his patients in the need of oral hygiene as a preventive measure and the proper technique to be employed daily by every individual. Every person should carry out a regular and systematic cleaning of the teeth and mouth after each meal and especially upon arising and upon retiring. Many people arise in the morning with a bad taste in the mouth. They do not relish breakfast but force themselves to eat and consequently bolt their food. This can be avoided by brushing the teeth before breakfast. It is especially important to retire with a clean mouth and clean teeth for the night, as this is the longest period that the organs of

the mouth are at rest. In order to obtain these results, it is necessary to have the proper tooth brush. A brush should consist of twelve tufts of bristles in length and three rows in width. The bristles should diminish in height from the heel to the toe of the brush and should be of medium flexibility. The Universal is also a very good tooth brush. There are three sizes of juvenile tooth brushes which should be selected according to the age of the child. In using the tooth brush a rotary motion should be employed which allows the bristles to pass into the interproximal spaces of the teeth and therefore remove those particles of food which would otherwise be carried into the spaces or forced under the free margin of the gum. Abrasions and injury to the soft tissues manifested in hemorrhages of the gums is a result of too severe usage of the tooth brush and should be avoided, as this invites infection and is oftentimes the starting point of acute stomatitis. Dental floss and tooth picks are useful if employed with care, but much harm can be done to the soft tissue if carelessly used. In cleaning the teeth proper tooth paste should always be used. Mouth washes have little or no inhibitive effect upon micro-organisms that inhabit the mouth, but are helpful in that they leave a pleasant taste in the mouth and relieve objectionable breath odors. The teeth should be scaled and thoroughly polished by instrumentation to remove salivary and serumal calculus not less than twice a year, and many individuals require scaling more frequently.

In the treatment of mouths affected with rapid dental decay from a hyperacid condition, the deleterious effects of the acids upon the teeth may be counteracted by the frequent use of alkaline or antacid solution such as bicarbonate of soda, one teaspoonful to half a glass of tepid water, or milk of magnesia or lime water in the same proportion.

The American public commits two great errors—in eating too much and too rapidly and in drinking too much liquid with their meals. Insufficient mastication and inadequate insalivation of food place work upon the stomach which should have been performed by the teeth and the salivary fluids. Bolting the food improperly masticated is not always the result of too rapid eating. It is often due to decayed and sensitive teeth with exposed pulps, which make mastication a torture or to loose teeth and soreness from abscesses, or from pyorrhea alveolaris, or from a loss of so many teeth as to

make proper mastication impossible. In the latter case this deficiency should be corrected by restoration of the lost organs of the mouth, while the former conditions may be cured or greatly relieved by appropriate dental treatment and the adoption of suitable hygienic regime.

The principles of oral hygiene being simple, there is no reason why they may not become a part of the curriculum of our public schools. Every child can be taught how to keep the mouth clean, and some of the more simple, social, cosmetic and scientific reasons for so doing. The children lack these facts because school boards, teachers, and parents themselves lack a knowledge of the fact of the very close relationship which exists between an unhealthy and an unclean mouth and many serious diseases of the body. At the Convalescent Hospital for Tubercular Children at West Chicago, the children are taught how to keep their mouths clean and are required to do so following every meal. The result is manifest. Last year two other dentists and myself spent two days at this hospital in the interest of these children's teeth. Out of a large number of children attended, but few needed very extensive scaling, showing conclusively the results of the regular and proper use of the tooth brush.

Mouth sepsis, sepsis from the medical and surgical standpoint, is the result or the resultant of the decomposition of necrosed tissue, either in the molecular form or enmasse, by a process induced by the action of non-pathogenic germs, and the formation of ptomaines and their absorption by the general system. Suppurative or septic conditions of the mouth are exceedingly common and are in a large majority of cases associated with the teeth. Many of the general diseases of the system may be traced to an infection from a pus pocket. A septic oral cavity is generally, if not always, the result of neglectful habits due to ignorance of the dangers of health and life which surround such conditions. Improperly constructed and neglected dental plates, bridges, crowns, faulty fillings, deposits of food debris, salivary and serumal calculus, caries, stomatitis, gangrenous dental pulps, gingivitis, acute and chronic dento-alveolar abscesses, chronic suppurative pericementitis (pyorrhea alveolaris) in the various forms are all active factors in producing a septic mouth.

You mothers are responsible for your children's physical and

mental development in which the development and condition of their teeth play an extremely important part. Your attention and your watchfulness of the teeth must begin with babyhood and continue until maturity. Your watchfulness will only show results by having your children form the habit of properly cleaning their teeth. If you have fulfilled your obligation in this respect you will have guided them through the most dangerous period of their lives as far as their teeth are concerned.

The result of extensive experiments tried proved beyond a doubt that if oral hygiene were taught in our public schools, also like instruction given to the parents and the public at large, and the teeth of the children properly cared for, even at public expense if necessary, great advantage would accrue to the state and to the future citizens of the country. It would lessen the expense of education, reduce the number committed to institutions, and assist in elevating the physical, mental and moral stamina of the nation for—"The health of the people is supreme."

THE INTERPROXIMAL SPACE AND CONTACT POINT*

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There is only one circumstance that prevents your essayist from apologizing for bringing this topic before you on this occasion. So much has been written upon it that it would seem as if the last word had been spoken on the subject, and that to attempt anything further would merely be to indulge in tiresome repetition. And yet every day in practice we see the dire results of a failure to recognize the significance of these two things—the interproximal space and the contact point. So much is this the case that repetition, even though tiresome, is deemed urgently necessary till such time as the profession wakens to its full responsibility in this matter, and remedies more generally than it does the evils that result from a lack of observance of the principles involved in a study of this question.

To go back to fundamentals it may be profitable to review briefly the form and function of the interproximal space, the

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normal form of the gum tissue in it, and the form and function of the contact point. All of these are important if we are to understand the philosophy of the mastication of the food of man in a comfortable, efficient manner, and without the disastrous results which follow the lodgment of food particles between the teeth in the interproximal space. This space is located between the proximal surfaces of two teeth as they stand side by side in the same arch. It is pyramidal in form, with the base of the pyramid located at the alveolar process, and the apex at the contact points on the two teeth. It is bounded mesially and distally by the proximal surfaces of the teeth, and it slopes away buccally (or labially) and lingually into two embrasures leading out to the buccal (or labial) and lingual surfaces of the teeth.

When the gum tissue fills this space in a normal condition it naturally takes on the form of the space itself, and one of the most significant things connected with this form is the fact that in passing from buccal to lingual the gum forms an arch, with the crest of this arch located at the contact points. It is this arched form of the gum which contributes most to the self-cleansing nature of the space in the mastication of food. As the food is caught between the masticating surfaces of the teeth and divided, it is caught by the sloping surfaces of the arched gum and deflected buccally and lingually away from the space. So long as the contact points are of the proper form and the gum tissue normal the tendency is always to shed the food buccally and lingually, and prevent its lodgment in the interproximal space. Of course it goes without saying that in order for the gum to be normal the space in which it lies must be of the proper form. If the space is narrowed mesio-distally by the dropping together of the two teeth the gum is crowded so that it cannot maintain its normal form. The usual result is that instead of preserving an arched form the gum takes on an inverted arch, with the buccal and lingual festoons of gum extending farther crown-wise than the gum midway between the teeth. This results in a decided pocket in the interproximal space which catches and retains food particles to the early and ultimate destruction of the tooth by decay or an impairment of the supporting structures of the teeth by the formation of a pyorrhea pocket with pus formation. The leaking of food particles between the teeth through faulty contacts, and its retention through

faulty interproximal spaces is accountable for more mischief than is usually attributed to it, one writer going so far as to state that 80% of the pyorrhea pockets were started in this way.

The form of the contact point has much to do with comfortable mastication, and the preservation of normal gum in the interproximal space. The contact point on normal human teeth is a small curved eminence on the proximal surface near the occlusal or incisal. From this small contact the proximal surface of enamel slopes away more or less abruptly, leaving the area in actual contact exceedingly small. This holds true of broad teeth like the molars as well as of narrow teeth like the incisors or cuspids. The philosophy of this narrow contact relates to the fact that when food is forced between the proximal surfaces of the teeth, as it will at times, it is not retained there owing to the limited area. If the contact were broad, as we sometimes see it on fillings, food particles would be held between the teeth, leading to all the evils we have indicated.

The reason we may have fibrous food forced past the contact points at times is this: In the ordinary process of mastication when the food is crushed between the occlusal surfaces of the teeth it is ordinarily divided by the contact points and forced buccally and lingually; but there is an individual movement of the teeth one against the other, and in this movement or rubbing together it occasionally happens that fibers of food will slip past the contacts. Where the teeth are firm in their sockets, and the form of the occluding teeth is such that the teeth in question are not forcibly driven apart at each occlusion, this passing of food between the contacts is only occasional, and with narrow contact-points no harm results, because the food is not held in the interproximal space.

With the clear idea in our minds as to the normal form and function of the interproximal space and the contact-point, let us see what happens when decay occurs in the proximal surface of any tooth. Caries usually begins slightly rootwise of the contact-point, but it does not progress very far before the contact-point is involved. The moment this happens the tooth next in line begins to drop into the cavity thus formed, and narrows to that extent the mesio-distal width of the interproximal space. This, as has been seen, invites the retention of food particles in the space and ruins the gum tissue filling it. This gum never again becomes

normal unless the operator recognizes the condition and does several things to remedy the damage done. He must first regain the mesio-distal width of the space by wedging the teeth back to their normal place in the arch, he must give such form to the proximal surface of the filling that the original interproximal space and contact-point are restored, and he must see to it that the contact-point on the filling be made sufficiently dense and hard that it will stand up under the wear occasioned by the individual movement of the teeth just referred to. Neglect of any one of these will result in an imperfect operation which will lead to discomfort to the patient and ultimate failure of the operation itself.

This matter of hardness of the contact-point is important. Reference has been made to the individual movement of the teeth one against the other, and this is so great in many instances as to result in worn facets on the proximal surfaces of the enamel where the contact-points originally were. In all mouths this wearing of facets is apparent more or less as age advances, in some cases to the extent of leaving facets three or four millimeters wide buccolingually. Many cases of pyorrhea pockets have been started in this way, even where the teeth themselves have not decayed owing to an immunity to caries in that mouth. If then as hard a structure as the enamel may be worn to this extent it goes without saying that the ordinary filling materials will wear much more rapidly. The only filling we have which will approach the natural enamel in hardness is the porcelain inlay, and it has limitations which exclude it from many of these cases. Next to porcelain must be mentioned gold, either in the form of foil or as an inlay. If in the form of foil one thing is necessary in order to secure a good contact-point. That is that the gold at this point be hardened especially for this purpose. This can be done by mallet impact over the contact-point for some time after density is reached. In other words, it is possible to harden the surface of gold by malleting even after the layers of foil have been brought into intimate contact and a high specific gravity obtained. This hardening of gold may best be done by a light steel mallet in preference to a heavy, soft mallet.

With the gold inlay good contact may be secured more readily than by any other means at our command, except, as before stated, with the porcelain inlay. This is one of the supreme advantages of the gold inlay that by its use we can more easily and uniformly

obtain perfect contact-points than with any filling material which has to be inserted piece by piece. The fact that it can be shaped and polished out of the mouth is a great advantage, minimizing as it does the discomfort to the patient and providing a very easy means of gaining any desired form to the filling. As to hardness, this may be secured by grinding away a small portion of the proximal surface of the inlay in the vicinity of the contact, and flowing over this some 18 karat gold solder. This can be rounded out into a perfect contact-point, and it will wear well.

Of all our filling materials which may be classed as permanent the poorest so far as concerns maintaining a good contact-point is amalgam. I deem it one of the great limitations of amalgam when used in the proximal surfaces that it does not stand up well against this lateral wear. It is never therefore a reliable protection against the wedging of food into the interproximal space. Invariably after a few years an amalgam filling will show a broad facet worn in the proximal surface.

In the insertion of a gold inlay advantage should always be taken of the fact that it is possible to tighten up the contacts in the immediate vicinity of the tooth to be filled. As a tooth decays in the proximal surface, and the adjoining tooth begins to fall into the cavity, it not only injures the interproximal space between those two teeth but it loosens up the contacts between the adjacent teeth. If the cavity has existed for any length of time it is advisable to wedge the teeth quite extensively by packing gutta percha into the cavity and wearing it as a filling for several weeks or even months. This will usually spring the teeth back to their original position in the arch, and tighten up the contacts. One precaution is necessary in wearing this gutta percha wedge for any appreciable time. If the gingival wall of the cavity is left sloping so that there is an incline from the axial wall to the gingival margin, the gutta percha when subjected to the impact of mastication is likely to be forced down this incline and squeezed out into the interproximal space without exerting any material wedging force to separate the teeth. In this way the gum septum may be injured by the gutta percha. In all cases where gutta percha is to be used for separating teeth the gingival wall should be flattened in advance, so that when pressure is brought to bear on the gutta percha it will not slide out of the cavity, but will spread laterally and thus force the teeth apart.

When ample separation has been gained in this way it may be retained by making an inlay whose mesio-distal width is slightly greater than the original tooth tissue was at this point, and then driving the inlay to place with the mallet blow. This will usually bring forth the comment from the patient that the inlay is "too tight," but there need be little fear that this tight feeling will last any appreciable time. In fact an inlay which may be seated in the cavity without a slight protest from the patient due to this wedged feeling may be said to fall short of the ideal restoration.

In this way it is possible by the insertion of a single inlay to materially tighten up the contacts of several teeth on either side of the one filled, and thus add appreciably to the integrity of the arch in this region.

Reference has been made to worn facets in the enamel, and while these usually come at a period of life when the mouth is most likely to be immune from dental decay, yet we do occasionally find a cavity beginning in one of these facets, due to the retention of food between the teeth. In every such case advantage should be taken of the necessity for a filling, to improve conditions, so far at least as that one interproximal space is concerned. This may readily be done by wedging the teeth well apart—a procedure not difficult of accomplishment owing to the slight looseness of the teeth from proximal wear—and then rounding off the edges of the facet on the tooth facing the cavity, so that the proximal surface of that tooth will present a rounded aspect to the filling, and then building the filling or inlay out to a small tight contact with this tooth, thus restoring normal contact and a relatively normal interproximal space. This will render this particular area more comfortable and effective for mastication. I look upon any opportunity or plan to tighten contacts where they have loosened up as a very important matter for our consideration, and while I have seldom done as was advised by the late Dr. G. V. Black, viz:—to make a cavity in a sound tooth for this purpose, yet I believe we would be doing better service for our patients if we did this oftener.

There is one class of cases to which I particularly wish to call your attention at this time. I have said that if we have a perfect contact-point and a well formed interproximal space food will seldom lodge between the teeth. In a general way this holds true, but there are some cases which puzzle us with an apparent contradic-

tion unless we study carefully the conditions which bring them about. For instance we may find at times the lodgment of food between teeth where the contact seems perfect, and where it is difficult to account for it. We may test the contact with a ligature and it snaps past the contact-point, showing it to be small and rounded, and yet fibrous food lodges between the teeth. A solution of this phenomenon may usually be discovered by examining the occluding teeth. It will be found that a sharp cusp on one of the opposing teeth impinges over the contact-point of the affected teeth in such a way that on each closure of the jaws they are sprung apart by the wedging force of the cusp. This constant springing apart admits food more and more till the gum is crowded back, and a space created which forms a receptacle for more food. It is not always possible to discover this sharp cusp by examining the teeth from the buccal aspect. The only logical way is to take a bite in modeling compound and pour models in plaster. The relation of the upper to the lower teeth may then be studied from the lingual as well as the buccal aspect, and the exact condition noted. In every instance the remedy is simple. All that is necessary is to grind down the offending cusp so that all wedging force is done away with, and the difficulty is at an end. Occasionally we may find that this continued springing apart of the teeth has caused a slight loosening so that the teeth separate quite easily, in which event some particles of food may continue to slip past the contact for a short time even after the opposing cusp has been shortened. But it is only a brief period before the teeth have again tightened, and the trouble has disappeared.

I look upon the entire question of the interproximal space and the contact-point, and the maintenance of healthy gum tissue in this vicinity, as among the most important we are confronted with today, and I can only hope that the profession generally will recognize it more and more. In examining a set of teeth for a patient a keen eye should be kept for particles of food between the teeth and when any are found the patient's attention should be called to the matter, and the question asked if there is any annoyance from this tendency. Frequently the patient will tolerate the infliction indefinitely with the idea that it cannot be remedied, and also because they are not aware that any serious damage may result from it. When its possible evils are explained to them, and they are informed

that the condition may be controlled they are only too anxious to have it attended to. The responsibility therefore for the continuance of this evil must be largely laid at the door of the dentist, with all those patients who consult a dentist regularly. If this is clearly recognized by the profession it will make dentists more observant when the care of a set of teeth is entrusted to them. If they overlook this, they overlook one of the most vital things connected with the problem of saving teeth.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.*

BY C. W. COLTRIN, D. D. S., CHICAGO.

The scientific scope of dentistry has become so vast and the literature covering the many fields of its activities so voluminous and varied, that it is difficult to even briefly summarize in a single report what has been accomplished during an entire year along these lines.

Thus in submitting the following report, your committee, being fully conscious of its incompleteness and other shortcomings, prays your kindest consideration in passing judgment upon his effort.

Although the last twelve months have been fraught with unusual disturbances, incident to the great war in which we are engaged, the growth in dental science and literature has, in the main, kept pace with the advancement of the times.

In general, it may be said that the dominant features of present dental practice are prevention and conservation.

In this connection it is noted that increasing interest is being shown in oral hygiene and dental prophylaxis by both the profession and the public.

While this is partly the result of educational propaganda, it is also due to the fact that the dentist himself has come to realize that his function is not merely to relieve pain and replace missing teeth, but to use all known reputable measures in preventing diseases, both local and systemic which may arise from infections or disorders in his field of operation.

Judging from the present it would seem that if dentistry is to

*Read before the Illinois State Dental Society, May, 1918.

rise to its full stature in the future as a real factor in the conservation of the public health it will probably be by faithful and conscientious effort along these lines.

Perhaps the most important event of the year was the passing of a bill by congress, which placed the professions of dentistry and medicine on an equal footing in the army. This testimonial to the worth and importance of our profession, as a factor in the conservation and maintenance of the best possible health conditions in our armies, is, of course, gratifying. Yet in view of our attainments in the great art of healing and the close relationship we have come to bear to the medical practitioner in certain fields, together with mutual interests and endeavors in scientific investigation, leading toward the solution of the etiological mysteries of many diseases yet unsolved, we can but feel that, instead of being merely complimented, we have in reality come into our own. However, it is to be hoped that this step, which has brought the two professions into closer touch than ever before, will be followed by others in the same direction; that both may be of greater service to humanity.

Many excellent papers have been written during the year which for the sake of brevity can not be mentioned in this report. As to the quality and character of the year's literature as represented by the articles in our journals, it has perhaps never been of a higher order.

PROSTHETIC DENTISTRY

In this field notable advancement has been made in the last few years. After a period of apathy the profession has awakened to the necessity of better and more scientific methods in denture construction. Thus at the present time a lively interest is being shown in the subject and we are "all attention" to the advanced theories and methods now being presented by some of our most able and prominent prosthetists.

PARTIAL DENTURES AND BRIDGE WORK.

The advent of radiography which resulted in investigations in regard to focal infections in the dental field and their bearing upon pathological conditions in organs or parts remote therefrom has brought us face to face with some perplexing problems. While, perhaps, the findings of these investigations have been so far somewhat vague and incomplete, enough light has been thrown on the

subject to plainly show that some of our previous methods of practice must be materially modified. This pertains particularly to the retention of devitalized teeth in the mouth as a means of anchorage for either fixed or removable partial dentures. Until it is definitely settled as to just what class of devitalized teeth, if any, may be safely retained in the mouth, the final status of crowns, fixed or removable bridges or partial dentures anchored to other than vital teeth, can not be determined. Principally because of this fact a wide difference of opinion now exists as to methods of retention in the various kinds of partial denture constructions.

In certain sections of the dental world methods are advocated which in their application require devitalization and extensive destruction of tooth substance, while in others various kinds of clasps and attachments are favored which are applied to vital teeth without destruction or mutilation of either their surfaces or substance. Again there is a difference of opinion as to whether the partial denture of the future is to be what is called "movable removable" or of the more stable and rigid variety classed simply as removable. Several papers have appeared during the year in which the various phases of this subject and the problems involved are discussed, among which the following are noted:

"Attachments to Vital Teeth" by the author of this report, read before this society at its last meeting and published in the DENTAL REVIEW of September, 1917. In this paper a general historical review of the whole subject of attachments to vital teeth was attempted, partly for the purpose of familiarizing the profession with what had already been accomplished in this field and partly for the purpose of stimulating new thought and developing new ideas along these lines. Attention was also called to a few new attachments of this class, among which were some new ideas in wire clasps by Dr. F. E. Roach of Chicago.

CLASPED PARTIAL DENTURES VERSUS BRIDGE-WORK

By Hart J. Goslee, B. S., D. D. S., of Chicago, published in
March Items of Interest, 1918.

While Dr. Goslee states that the object of his paper is to deal mainly with clasps, as applied to vital teeth, he nevertheless goes quite extensively into the general subject of both fixed and removable partial denture construction. Besides introducing a certain

type of double loop wire clasps which he has found useful and efficient in his practice, he makes a plea for a greater manifestation of interest in general clasp construction; especially in that type which is applied to vital teeth without destruction of their surfaces or substance and which in operation will produce a minimum amount of harm either to the teeth or surrounding tissues. He also calls attention to the important fact that while removable partial dentures are in a great many cases desirable, they should be constructed in such a manner as to meet the demands of the masses as well as the classes.

In this connection he states in substance that, while such attachments as those advocated by Peeso and Nash are entirely acceptable from the standpoint of mechanical perfection in construction and adaptability, they fail to meet the necessities of the present conditions; first, because in their application they require devitalization which in many cases, at least, is undesirable and second, because their proper use requires an exceptionally high order of skill and consequently a higher fee must be obtained than can be paid by other than people of considerable means.

In the discussion of Dr. Goslee's paper, Dr. Norman Essig, of Philadelphia, presents some new types of attachments called "Movable clasps." These attachments have a movable joint between the clasp and the base or saddle. The advantages claimed are automatic adjustment and a minimum amount of strain upon the teeth clasped.

Another interesting paper on this subject appears in March *Dental Cosmos*, 1918, by Norman B. Nesbett, D. M. D., of Boston, Mass., entitled "A Simple Form of Removable Bridge-Work with Cast Clasps." In this paper the technic of making a simple form of removable bridge of one or two teeth is given. The principal advantages claimed are—"no devitalization of pulps, simplicity of construction, a maximum of stability and food-grinding surface and almost universal application." A paper which will interest all concerned in solving the problems which present in this class of cases.

MOBILE BRIDGES.

By Dr. L. Gormsen of Copenhagen, Denmark, published in
Items of Interest, February, 1918.

The essayist begins by saying "That bridges should have a

certain mobility so that their abutments, the natural teeth or roots, may not be subjected to unnecessary strain." The ideas expressed in this paper will perhaps bring forth considerable argument for the reason that it is still an open question whether or not this mobility is altogether necessary or desirable in either fixed or removable bridge-work.

In carrying out his method, Dr. Gormsen proceeds to construct a removable bridge using Peeso split pin and telescope crown attachments, both of which are rigid. After all is finished, he then proceeds to grind the pins and copings until the attachments fit so loosely that they will almost drop off. However, it is not intended, he says, to have the attachments so loose that the bridge will fall out, but to secure just enough mobility to lessen the strain upon the abutments, which, owing to the elasticity of the tissues of the jaw, would obtain if the attachments were rigid.

With due respect to the ideas and opinions of the essayist, it is perhaps difficult to see just why we should go to the trouble of making a bridge of the type he describes, using attachments which require such exactness of adjustment as do the split pin and telescope crown varieties, and then deliberately ruin their efficiency in an attempt to secure this mobility which, if desired, could be obtained in most cases, by the use of simpler constructions and attachments. However, Dr. Gormsen's paper is an interesting and valuable contribution to the literature on this subject.

A very interesting paper on the subject of attachments to vital teeth appears in the July *Dental Cosmos*, 1917, entitled "Further Consideration of the Pinlay (Posterior) and the Pinledge (Anterior) Bridge-Attachments, by Jas. Kendall Burgess, D. D. S., New York, N. Y. Dr. Burgess presents in this paper a certain type of attachment which is constructed along the lines of what is known as the Pin-inlay. The paper is interesting throughout and the attachments will be found of value in handling certain cases of bridge-work with vital teeth as abutments.

"ATTACHMENTS TO VITAL TEETH."

By Edward T. Tinker, D. D. S., Minneapolis, Minn., Published
in the DENTAL REVIEW of April, 1918.

Dr. Tinker is a recognized authority on the cast gold shoulder crown and its various modifications used upon vital teeth for bridge

attachment, and while he offers nothing particularly new, his paper is of interest as a review of the technique which he employs in this work.

FULL DENTURES.

The present revival of interest in this department is largely due to the efforts of a few men in the profession who, realizing its importance and that the methods of construction usually employed were inadequate to meet the requirements of well adapted and anatomically correct and efficient full dentures, put their shoulders to the wheel and brought about the wonderful improvements we see today. Among those whom we may mention in this connection are Drs. Gysi, Williams, Green, Wilson, Campbell and Hall. While all of these men deserve our utmost praise and appreciation, we are, perhaps, particularly under obligation to Dr. Rupert E. Hall of Chicago for the splendid work he has done and is now doing for us along these lines. Although great interest has been stimulated in this subject, comparatively little has been written upon it during the past year.

A very interesting and instructive paper by Dr. Hall, entitled "Retention of Full Dentures," was read before the Chicago Dental Society at its December meeting in which he discussed the theories and principles of retention of full dentures and denture adaptation. Dr. Hall's technique of impression taking is also given in full in this paper (published in the DENTAL REVIEW March, 1918).

Attention is also directed to a series of papers on "closed mouth" impressions by Dr. Samuel G. Supplee, of New York, now being published in the *Dental Digest*.

Another interesting paper on the subject of full denture construction was presented at the last meeting of the National Dental Association in New York, by Dr. Dayton Dunbar Campbell, of Kansas City, Mo., entitled "Why Measurements of the Mandible, Tracings of the Condyles, The Construction of a Hypothetical Triangle, and The Use of the Face-Bow, are all Non-Essential to the Construction of Full Dentures Possessing the Highest Degree of Efficiency," published in March number of *The Journal of the National Dental Association*, 1918.

The principal points of interest brought out in this paper are first, that elaborate and complicated measurements of the mandible

and tracings of the condyle paths are not essential in the construction of efficient dentures, mainly for the reason that the gyrations of the condyles are determined solely by the tactile sense of the tooth cusps in the triturating movements of mastication; and second, that the use of the face-bow for the purpose of maintaining upon the articulator the relations of the occlusal plane and the perpendicular of the triangle are superfluous and unnecessary. On this point Dr. Campbell says "the strongest recommendation of the face-bow has been that it enabled the operator to open or close the bite. Or, in other words, it enabled the dentist to correct an error which should have been avoided through the use of a proper technique. This consists in maintaining a constant correct relationship between the upper and lower jaws—and when correctly obtained there is no occasion to open or close the bite."

The technique referred to, by which Dr. Campbell accomplishes the above, is given in full with illustrations which materially aid in getting a clear understanding of the principles involved.

While the arguments presented are founded mainly on the teachings of Dr. Hall, whose ardent disciple Dr. Campbell confesses himself to be, they also show a wide understanding on the part of the essayist of the practical and scientific phases of this subject which is now engaging some of the best thought in the profession.

"Type versus Temperament," by Dr. Norman S. Essig, of Philadelphia, Pa., a series of papers, pub. in *The Dental Cosmos*, Sept., Nov. and Dec., 1917, and Feb., 1918. In these articles Dr. Essig presents a definite system for the selection of teeth in making artificial dentures.

OPERATIVE DENTISTRY.

Although many excellent papers have appeared in which the different subjects of this department have been discussed, nothing that is particularly new can be reported.

"Cavity Preparation for Gold Foil, Gold Inlay and Amalgam Operations," by Walden I. Ferrier, Burlington, Wash., pub. in *The Journal of the National Dental Association*, Nov., 1917.

"The Principles of Black's Cavity Preparation," by R. R. Byrnes, D. D. S., Richmond, Virginia, pub. in *Dental Cosmos*, Jan., 1918.

"Modern Amalgam Restorations," by J. V. Conzett, D. D. S.,

Dubuque, Ia., pub. in *The Journal of the National Dental Association*, July, 1917.

A splendid paper on this subject by one of our best operators who knows whereof he speaks.

"The Manipulation of Amalgam," by Thomas P. Hinman, D. D. S., of Atlanta, Ga., pub. in *Items of Interest*, Feb., 1918. This is an unusually comprehensive paper upon this very important subject.

"Porcelain Technique," by Geo. A. Thompson, D. D. S., Chicago, pub. in *The DENTAL REVIEW*, March, 1918, and continued in the April number. In the first article the essayist deals with the color problem and its solution. In the second, he takes up the technique of constructing the porcelain jacket crown.

Besides discussing the above subjects which he deals with in a masterly manner, the essayist takes occasion to beckon us back to the once glorious field of accomplishment in dental art—that of the porcelain inlay.

SILICATE FILLINGS.

Silicate has come into almost universal use as a filling material and has proven that it has qualities which give it a permanent place in practice. However, very little seems to have been written about it in the past year. The following articles are about all that can be noted at this time.

"Manipulation of Silicate in the Making of a Filling," by Clyde Davis, M. D., D. D. S., Lincoln, Neb., pub. in *The Journal of the National Dental Association*, July, 1917.

"The Chemistry of Silicates and Their Application in Dentistry," by C. C. Vogt, A. B., Ph. D., Mellon Institute of Industrial Research, Pittsburg, Pa., pub. in *The Journal of the National Dental Association*, April, 1918. As it is important in the use of silicates to fully understand both their physical and chemical properties, the information given in this paper is not only valuable, but timely.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

"A Review of the Pathology of the Peridental Membrane," by Frederick B. Noyes, A. B., D. D. S., Chicago, pub. in *The DENTAL REVIEW* of Jan., 1918.

"The Histological Pathology of Alveolar Abscesses and Dis-

eased Root-ends," by Kurt H. Thoma, D. M. D., Boston, Mass., pub. in *Dental Cosmos* of January, 1918.

"The Pathogenesis of Focal Infection," by E. C. Rosenow, M. D., Rochester, Minn., pub. in *The Journal of the National Dental Association*, Feb., 1918.

In this paper Dr. Rosenow gives the results of his studies and laboratory experiments in regard to the localization of bacteria.

"Oral Foci of Infection," by H. H. Schuhmann, M. D., D. D. S., Chicago, pub. in *The DENTAL REVIEW*, Nov., 1917.

A general review of the subject is given with comments upon its different phases, and the ideas in regard to them which at present prevail among investigators in this field.

In summing up, Dr. Schuhmann makes the following statement which should be noted: "The relationship of oral foci of infection to general bodily disease is still a new problem and the more definite conclusions are crystalizing fast, but much more research and proof is necessary before we follow blindly the propaganda of ruthless extraction."

"The influence of General Health on Oral Tissue," by Leroy M. S. Miner, M. D., D. M. D., Boston, Mass., pub. in the *Dental Cosmos* of March, 1918.

In this paper the essayist presents the results of observations which, he states, afford a viewpoint opposite to that of infected teeth as factors in producing general disease. He gives as the fundamental truth underlying the substance of his paper "That while defective teeth undoubtedly may cause systemic disease under certain conditions, it is equally true that general disease may cause pathological conditions in the mouth."

ANESTHESIA.

"Selection of Anesthetic for Oral Operations; and Roentgen Ray as an Aid in Diagnosis," by Kurt H. Thoma, D. M. D., pub. in the *Dental Cosmos*, March, 1918.

This paper deals with points which are helpful in the selection of an anesthetic in the different classes of cases met with in every day practice.

"Administration of Nitrous Oxid for Dental Operations," by J. E. H. Atkeissen, M. D., Chicago, pub. in *The DENTAL REVIEW* of Feb., 1918.

A general consideration of the subject from the standpoint of an anesthetist of wide experience in hospital work.

LOCAL ANESTHESIA.

While Nitrous-Oxid Gas still holds its place in dentistry as a most reliable and efficient general anesthetic, the attention and interest of the profession is, however, at the present time, centered more particularly upon developments along the lines of local anesthesia, produced by what is known as the conductive novocain suprarenin method.

Owing to the ease with which profound and lasting anesthesia can be produced by this method, it has rapidly become popular with both the profession and the public.

Whether anesthesia which is produced by injecting narcotic drugs, such as cocaine, novocain, apothesine and the like, into the deep tissues or nerve trunks is to be universally practiced in the future is as yet difficult to determine. For, notwithstanding the fact that the method is in the main efficient and at present widely practiced, it is, however, still in what may be termed "the stage of excitement" and has not been, perhaps, in use long enough to determine definitely as to its ultimate status in this regard. Because of special interest in this subject, a number of papers have appeared during the year in which it is discussed from almost every angle. Principally, however, from a technical standpoint in which it is exceptionally exacting as to operative procedure, acespis, and knowledge on the part of the operator of the anatomy of the fields of operation. Besides, the operator must have an exact knowledge of the drugs employed and their antidotes to be able to guard against possible dangers of narcotic poisoning.

The following papers on this subject are of interest:

"Local Anesthesia," by Dr. Arthur E. Smith, of Chicago, pub. in *Items of Interest*, June, 1917.

Perhaps no one has made a more careful study of the technique of conductive anesthesia than has Dr. Smith. In this paper he treats of the entire subject in a most comprehensive and instructive manner. The operative technique of nerve blocking is given in full with illustrations photographed from actual dissections.

"Indications and Practical Application of Local Anesthesia in

Dentistry," by P. G. Puterbaugh, M. D., D. D. S., Chicago, Ill., pub. in *DENTAL REVIEW* of Feb., 1918.

A very instructive paper which, as its title indicates, deals with the practical fundamental principles of the subject.

RADIOGRAPHY.

As radiography in dentistry is comparatively a new science and is as yet in the development stage, it naturally follows that much which is said or written about it will be more or less speculative as to its definite value. Thus we find a mass of literature in our journals upon this subject which deals almost altogether with individual opinion and not with definite substantiated knowledge as to just what pathology is or is not shown upon an X-ray film. In looking over these writings which emanate from both the medical and dental professions, one finds that the present status of radiography seems to be as a "more or less valuable aid" in diagnosis, but not positive enough in all its findings to be relied upon entirely for that purpose.

Whether this science will develop to the extent that definite and reliable readings can be made of pathological conditions in the tissues surrounding the roots of teeth or adjacent thereto, which conditions are now known to be at times perilous to both life and health, remains for the future to disclose. But if it should never develop to this extent, it will have served a great purpose in calling attention to the existence of these dangers which were previously unrecognized and which in the future must be reckoned with by both medical and dental practitioners. That this subject has been receiving serious thought and attention during the past year is evidenced by the number of papers which have been written upon it and published in our journals, among which the following are noted:

A symposium consisting of four papers presented before the Chicago Dental Society Feb. 20th, 1917, by Drs. H. E. Potter, H. L. Lewis, F. D. Leach and Frederick F. Molt, all of Chicago (published in the June number of *The DENTAL REVIEW*, 1917.

(a) "The Main Value of Radiography in Dentistry," by Hollis E. Potter, M. D., Chicago. In this paper a wide and comprehensive view is taken of the present status of the X-ray in dentistry and its probable future development and usefulness. In the beginning Dr.

Potter states that the X-Ray is helping to build a new mile-stone in the practice of dentistry. Continuing, he says, "Behind us is the dentist who attended to the teeth of his patient from the standpoint of symptoms, appearance, and efficiency in mastication. Before us is the dental surgeon who, without forgetting any of these points, uses as a basis for all his procedures the added dictum of pathology, local and general." Again he says, "for the intelligent recognition and application of the pathological data which is capable of being derived by the X-Ray method, the dentist, himself, must become thoroughly familiar not only with the pathology of infections in general, but also with that pathology as characteristically seen on the roentgenogram." He further states that "there is no gainsaying the proposition that our present method of using X-Rays is inadequate. Many mistakes are made mainly because the radiographs themselves do not develop out all labeled for use as a great many seem to think. Thus, we frequently find notations on the card at the side of a film which are more misleading than the radiograph itself."

In answer to the question of what the future method of handling this proposition should be, Dr. Potter recommends it be left mainly to the management of the dental colleges. In regard to this he says: "Tomorrow with its oncoming practitioners must bring us men who learned at school to grasp all that is good in X-Ray work. Let the student be required to learn the fundamental principles of what may be called 'radiographic pathology' before calling his education complete."

(b) "Incorrect Interpretation of The Dental Radiograph," by Dr. F. D. Leach of Chicago.

(c) "The Proper Interpretation of an X-Ray," by H. L. Lewis, M. D., Chicago.

(d) "Correct Interpretation of The Radiograph," by Dr. Frederick F. Molt of Chicago.

In these last three papers the proposition of intelligent interpretation of what is shown on X-Ray films is discussed, also the principles and technique of X-Ray work from the standpoint of the radiographer. Several other excellent papers on this subject have been presented during the year, among which are the following:

"Infection Sense and Radiographic Diagnosis," by Raymond

Wenker, M. D., D. D. S., Milwaukee, Wis., pub. in *THE DENTAL REVIEW*, Jan., 1918.

"Notes on Radiographs and the Surgical Treatment of Septic Teeth and Alveolar Process," by Joseph Novitzky, pub. in *Items of Interest*, Jan., 1918.

"Radiography and the Dentist," by E. G. Weeks, Saginaw, Mich., pub. in *The Journal of the National Dental Association*, Feb., 1918.

SURGERY.

Because of the war, increased interest is being shown in all branches of surgery. Especially is this true of oral and plastic surgery, both of which are of great importance in restoring the shattered faces of wounded soldiers at the front. Of the articles particularly related to war surgery, the following are of interest:

"The Past, Present and Future of Plastic Surgery About the Head and Neck," by Joseph C. Beck, M. D., Chicago, pub. in *THE DENTAL REVIEW* of April, 1918.

This article is an extemporaneous talk with presentations of photographs which was given before the Odontological Society of Chicago. The talk consisted of a historical review of the subject interspersed with thoughts and comments upon modern methods of practice along these lines.

"Healing of Lower Jaw Bone Defects in War Cripples," by Dr. J. F. S. Esser, Dutch Special Surgeon for Plastic Operations, pub. in *American Journal of Surgery*, Dec., 1917.

"Two Cases Illustrating Plastic and Dental Treatment," by H. D. Gillies, F. R. C. S. Eng., pub. in the *Lancet*, Dec. 8, 1917. Case 1—Re-formation of the chin and lower lip by double pedicled bridge flaps and cartilage graft. Case 2—Restoration of the nose by dental splint and cartilage graft.

"A Few Notes on the Treatment of Gunshot Wounds of the Mandible and Maxilla," by W. Kelsey Fry, M. C. M. R. C. S., L. D. S., who is in charge of the dental department of Queens Hospital, Sidcup, pub. in the *Lancet*, Dec. 8, 1917.

The following statement by Dr. Fry may be of interest: He says, "Taken roughly, seventy-five per cent of the patients admitted for treatment in this department have fractured mandibles with or without fracture of the maxilla; a further ten per cent have frac-

tures of the maxilla that require dental treatment, and the remaining fifteen per cent are purely plastic cases."

"Pathology of War Surgery with Reference to Its Relation to Diseases of the Mouth," by Leo Kloesser, M. D., San Francisco, Cal., pub. in *The Journal of the National Dental Association*, Oct., 1917.

In this article the essayist treats particularly of Tetanus, Gas-Phlegmon, and Septic affections in general.

GENERAL ORAL SURGERY.

"Impacted Lower Third Molars," by C. Edmund Kells, D. D. S., New Orleans, La., pub. in *The Dental Cosmos*, Feb., 1918.

This is an interesting paper in which the essayist demonstrates a special forcep for extracting impacted third molars. He also makes some very timely comments upon modern surgical practice and upon nature's method of caring for wounds caused by extraction.

"Surgical Technique of Root Resection in Granuloma Cases," by Carl D. Lucas, D. D. S., of Indianapolis, Ind., pub. in *The Dental Summary* of Jan., 1918.

"Restoration of Abnormal Mouths by Surgical Treatment Before Inserting Plates," by J. P. Ruyl, D. D. S., New York City, pub. in *The Dental Digest*, Feb., 1918.

This is one of a series of papers on this subject appearing in the *Digest* which will be of interest to prosthetists.

"Fractures and Dislocations of the Jaw," by Dr. Chalmers J. Lyons, pub. in *The Dental Summary*, Jan. and Feb., 1918, which is one of a series of articles upon the general subject of fractures of the jaw.

"Excision of the Alveolar Process," by Earl H. Westenhaver, D. D. S., Kansas City, pub. in *The Dental Cosmos*, Oct., 1917.

ROOT CANAL FILLING.

Nothing particularly new is to be reported on this subject. It seems, however, that the crest of the great wave of excitement caused by the focal infection scare has about passed over and that we are beginning to calm down to a more rational view of the situation in regard to root canal work. While there can be no question

but what the findings regarding certain foci of infection about the root ends of devitalized teeth will have a great influence upon the treatment and filling of root canals in the future, it does not necessarily mean, however, that the careful clean root work of the past was a failure and should be abandoned, but rather that every effort should be made to continue producing work of that kind. While volumes have been written on the subject, the following articles are perhaps of special interest:

"The Teaching of the Technic of Cleaning, and Curetting and Filling Root Canals," by Edgar D. Coolidge, D. D. S., Chicago, pub. in *The Journal of the National Dental Association* of April, 1918.

"Technique of Pulp Canal Surgery," by Dr. Elmer S. Best, of Minneapolis, Minn., pub. in *THE DENTAL REVIEW*, Sept., 1917.

"What Root Canal Technique Should Be Practiced in Army Cantonments, and for Children in Public Dental Clinics," pub. in April *Items of Interest*, a symposium, consisting of opinions and comments upon this subject by the following well-known practitioners: "Dr. Thos. P. Hinman of Atlanta, Ga., Dr. A. C. Fones of Bridgeport, Conn., Dr. M. L. Rhein of New York, Dr. Thos. B. Hartzell of Minneapolis, Minn., Dr. Edgar D. Coolidge of Chicago, Dr. Elmer S. Best of Minneapolis, Minn., Dr. J. P. Buckley of Chicago, Col. J. H. Snapp, Camp Upton, and Col. G. Mason, Camp Dix."

This article is particularly interesting as it touches upon the very important subject of what is to be done with the great number of devitalized teeth in the mouths of our soldiers which are in need of treatment and must be cared for by the army dentists.

"Diagnosis and Treatment of Destructive Diseases of the Dental Pulp, and a Method of Removing the Dead Tissue from the Canal," by J. P. Buckley, P. H. G., D. D. S., Chicago, pub. in *THE DENTAL REVIEW*, Dec., 1917.

In this paper the essayist calls attention to the fact that the pulps of countless teeth are being sacrificed because of lack of knowledge or carelessness in diagnosis, especially as to simple pathological conditions, such as hypersensitive dentine or, what is perhaps more serious, differential diagnosis between active and passive hyperemia. The treatment of pulpless teeth is also considered in this paper from both the standpoint of operative procedure and medication.

ORTHODONTIA.

The following articles on this subject are of interest. "The Results Observed in a Further Study of Prenatal Causes of Dentofacial Deformities," by B. W. Weinberger, D. D. S., New York, N. Y., pub. in the *Items of Interest* of Jan., 1916.

A study of the etiology of malrelation of the dental arches and malocclusion, in which the essayist presents evidence that dentofacial deformities may be of prenatal origin.

"Observations on the Form of the Dental Arch of the Orang," by Milo Hellman, pub. in the *International Journal of Orthodontia*, Feb., 1918. A scientific study of the form of the dental arch from observation along the lines of comparative anatomy.

"Movements of Teeth Predetermined by Engineering Instruments," by F. L. Stanton, D. D. S., New York, N. Y., pub in *The Dental Cosmos* of Jan., 1918.

The essayist presents a system in which engineering principles are applied in determining the relative movements necessary to change teeth from malocclusion to normal occlusion.

"Orthodontic Treatment of Advanced Cases and Patients Coming from a Distance," by J. A. C. Hoggan, D. D. S., L. D. S., Richmond, Va., pub. in *The Dental Cosmos*, Jan., 1918.

In this article the essayist describes the construction of a model with metal teeth, which can be removed singly from the original, placed in a new impression and a new model run up. The orthodontist is thus enabled to have a definite knowledge at all times of the progress of a case for which he has constructed an appliance and which is being handled by a practitioner at a distance. This is accomplished by the assisting dentist taking impressions from time to time, which are returned to the orthodontist. He then places the metal teeth in the new impression and runs up a new model, from which the progress of the case is noted and necessary changes in appliances made.

ORTHODONTIA.

"Determining the Shape of the Normal Arch," by Percy N. Williams, D. D. S., New York, N. Y., pub. in *The Dental Cosmos*, July, 1917, which is a general discussion of the proposition as to whether the arch varies according to type.

ORAL PROPHYLAXIS.

Mouth hygiene and dental prophylaxis has become the subject of the hour with both practitioner and patient in present day dental practice. Perhaps no phase of dentistry has appealed more strongly to the intelligent laity; hence it has rapidly developed into an important specialty which, if practiced sanely, will undoubtedly prove one of the greatest of all factors in the prevention of dental diseases. Numerous articles have been written on this subject during the year, most of which deal with operative procedures in regard to scaling and polishing the teeth. A few, however, treat of the subject in its broader sense which includes the education of the public along the line of home care of the mouth and the general principles of prophylaxis. The following articles by Alfred C. Fones, D. D. S., of Bridgeport, Conn., pub. in *The Journal of the National Dental Association* of Feb., 1918, are of special interest, as they cover practically the whole scope of the subject. The titles of the articles are as follows:

(a) "Film Showing the Technique of Dental Prophylaxis for the Dental Hygienist"; (b) "An Educational and Preventive Clinic in Public Schools of Bridgeport"; (c) "Mouth Hygiene for the United States Soldiers Stationed at Bridgeport."

"The Relation of the Dental Profession to the Health of the Public and the Instruction for Maintaining Mouth Hygiene That the Patients Should Receive from the Dentist," by Arthur E. Peck, M. D., D. D. S., Minneapolis, Minn. This is an interesting paper, which treats of the subject along educational lines.

"Oral Prophylaxis," by F. H. Skinner, D. D. S., Chicago, pub. in *The Dental Summary* of Oct., 1917. In this paper the subject is discussed from the standpoint of a specialist in this field.

REPORT OF THE COMMITTEE ON NECROLOGY.*

BY C. B. SAWYER, D. D. S., JACKSONVILLE, ILL.

To the President and Members of the Illinois State Dental Society:

We pause for a few minutes in our deliberations to pay honor and respect to the memory of our departed brothers who

*Read before the Illinois State Dental Society, May, 1918.

during the past society year have passed across the border to join the silent majority. Your Committee on Necrology beg leave to report as follows:

Most of these items are copied, more or less completely, from notices published in local papers.

DR. I. B. JOHNSON.

Ira Bayless Johnson was born in Wilmington, Illinois, October 7, 1859, and died at his home in Onarga, Illinois, at 5:00 p. m. Friday, July 27, 1917, at the age of 57 years, 9 months and 20 days.

At about the age of seventeen he began to study dentistry with Dr. E. H. Stewart in Joliet, Ill., and after a few years entered into partnership with Dr. Stewart for about two years. He then bought out the two dental offices and practice of Dr. McBirney in Gilman and Onarga, dividing his time equally between the two towns, but residing in Gilman six years. He then moved to Onarga and gave up the Gilman office, twenty-five years ago this summer.

His activities in Onarga covered a period of thirty-six years.

He was married March 24, 1882, in Joliet, Illinois, to Miss Elsie I. Bugbee, to which union were born two girls, who with the wife survive, viz: Mrs. Edith A. Smith of St. Louis, Mo., and Mrs. Elsie J. Stevens of Gary, Indiana. There are in addition two grandchildren.

About thirty years ago he united with the Onarga M. E. Church and has occupied positions of trust and responsibility in the church during all that period. He was a member of the official board, a steward and an usher at the time of his death.

He held various offices in the state and district dental societies.

Dr. Johnson was an exceedingly painstaking and conscientious workman and took special pride in keeping himself informed concerning the latest and most approved methods of dental art.

As a citizen he was above reproach. He took a lively interest in the events of his community life, although he was unable to participate in them as much as he would have done had it not been for a permanent disability that fell upon him thirty-

four years ago. Treating a patient in his office who had a diseased condition of the mouth, he did not notice that the skin on one of his own fingers was broken. Infection set in and for over four months he was a prisoner in bed, and a terrible sufferer from blood poisoning. As a consequence his health was shattered and he was obliged to exercise the greatest precaution to guard his strength.

His brief illness and sudden death is a shock to the community. His going is a public sorrow.

DR. C. R. HENRY, OF CUBA, ILL.

committed suicide by shooting himself September 4, 1917. His most intimate friends believed that worry over domestic troubles was the cause of his self destruction. He had a successful practice in Cuba and was a member of the Dental Reserve Corps.

DR. J. A. DIESTELOW.

Dr. J. A. Diestelow, of Chicago, died October 14, 1917, after an illness of about ten months, of paresis, in his forty-eighth year. He was born in Warren, Germany, June 24th, 1870. He was a member of the Chicago Dental Society, having joined in 1906. A bereaved wife remains to deplore his early demise.

DR. ALEXANDER RICHARDSON.

Dr. Alexander Richardson of Peoria died November 13, 1917, at St. Francis Hospital, after an illness of seventeen days. He was born in Peoria, was graduated from the Chicago College of Dental Surgery and practiced in Peoria till his death. He was a member of the Peoria Dental Society and served a term as treasurer. He was married in 1914 to Miss Margaret O'Meara, who survives him.

He was a young man greatly loved by many friends. Funeral services were at St. Patrick's Church, where requiem high mass was celebrated by Rev. Father Graham. Burial in St. Mary's cemetery.

DR. E. B. DAVID.

Dr. Elijah B. David of Aledo, Illinois, was born in Ontario county, New York, June 8, 1835, and died January 3, 1918, of

blood poison, at the ripe age of nearly 83 years. His parents moved to Grass Lake, Michigan, when he was three years of age. Here he grew to manhood and received his education at Albion College. He studied in the office of Dr. Dean, a well-known dentist of Albion. His health failed and he came west in 1858, and settled on a farm in Richland Grove township, in Mercer county.

He enlisted August 16th, 1861, as sergeant in Company A, 30th Illinois Volunteer Infantry, and was commissioned second lieutenant February 15th, 1862, and for meritorious conduct at Fort Donaldson he was made first lieutenant April 22, 1862. On September 3, 1862, he was made captain of his company and served in this capacity until his honorable discharge from the service on October 27, 1864, at Chattanooga, Tennessee. Members of his company testified to his good care of his men, to his brave leadership and his concern for their every interest. On his return from the war he lived in New Windsor until he moved to Aledo in 1873, and opened an office for the practice of his profession. Here he continued in active practice for 34 years, retiring in 1907.

He became a member of the Illinois State Dental Society in 1873 at Rock Island, Illinois, and continued active in his membership, holding the offices of vice-president, librarian, executive council, and various committees.

He was united in marriage on September 1, 1862, to Elizabeth Woodhams. Mrs. David passed away November 25, 1905. Dr. David left four children, Mae D. Hebbord, of Lincoln, Nebraska; Otto A. David, of Pittsburgh, Pennsylvania; Cora D. Pyles, of Coulee City, Washington, and Dr. G. L. David, of Aledo, Illinois.

Dr. David was a life member of the Illinois State Dental Society, a member of the Military Order of the Loyal Legion of the U. S. A., and a comrade of the G. A. R. of Aledo.

He early affiliated with the Baptist church and did splendid service in promoting the interests of the Aledo church.

Dr. David, although a professional man, was interested in so many lines of usefulness that it is impossible to say in what he was most influential. He served his community for many years in various capacities as officer in Mercer county and was

always faithful to whatever trust was imposed upon him in these places of responsibility. His encouragement of everything for the advancement of agriculture opened up perhaps the widest field for his usefulness. He was secretary of the Mercer County Fair for ten years. As a member of the State Board of Agriculture for thirty years he did an inestimable amount of good work in the several departments of the State Fair. He was auditor of that board for twelve years. He was a delegate from this board to the National Live Stock Association convention and was made secretary of the same.

He was chairman of the committee which inaugurated old soldiers' day at the Illinois State Fair. He represented the Fourteenth Congressional District as a commissioner of the World's Columbian Exposition at Chicago, in 1893, and was chairman of the Horticultural Committee which made the exhibit of those products of Illinois at the great show in Chicago that year. He was also one of the auditors of the Illinois Commission of the World's Columbian Exposition.

Dr. David's interest in agriculture was of practical value to his own locality and to the whole state as well. Before there was a law passed creating the Farmers' Institute, he at his own expense, organized and conducted farmers' institutes in every county in the Fourteenth Congressional District.

He never spared himself in his efforts to further the interests of good farming and stock raising and to bettering the conditions in agricultural life, and his untiring work has to some extent been appreciated by his fellow citizens and friends throughout the state and the country, by his having been honored with so many positions of trust and responsibility.

Dr. David rounded out a long and useful life with honor and fidelity. He was ill only about ten days and the end came peacefully.

Services were held at the residence of Dr. George L. David, Sunday, January 6th, at 1:30 p. m., by Rev. A. E. Moody, and the burial was in Hopewell cemetery.

DR. REUBEN NEAL LAWRENCE.

Another veteran of the Illinois State Dental Society has passed over. He was a man loved and honored by all the mem-

bers of that Society who know him; greatly loved by the membership of the Episcopal Church in Lincoln, whom he served faithfully many years as senior warden and lay reader, always officiating whenever, for any reason, the clergyman was absent; and respected and honored by the entire population of the town.

Doctor Lawrance died January 8th, of pneumonia, after an illness of only a few days, and he was in the active practice of his profession until the beginning of his fatal illness. He was past seventy-eight years of age, having been born July 13, 1839, in Logan county, Illinois.

He was a very successful practitioner of dentistry, being especially skillful with pyorrhea cases, and for this treatment many came to him from far distant places.

He joined the State Society in 1879 and was therefore a life member for the past fourteen years. He was president in 1900.

Doctor Lawrance was a classmate of the writer in the Ohio College of Dental Surgery in the winter of 1866-7 and having been a student or practitioner for four years, received his degree of D. D. S. after only one term in college. He practiced in Atlanta, Illinois, and Holly Springs, Miss., and came to Lincoln in 1878.

He was a veteran of the Civil War, having enlisted as a private in 1861 and being mustered out in March, 1866, with the rank of first lieutenant after a service of four years and eight months.

Doctor Lawrance was married in Cincinnati in June, 1868, to Miss Mary Cool. She died in December, 1915. There are two children living: Dr. Edward P. Lawrance, practicing dentistry in Lincoln, and Mrs. George H. Karcher of Chicago. He served with distinction in the Masonic Order and at the time of his death was Grand Prelate of the Grand Lodge of the State of Illinois. The following is copied from a Lincoln paper:

A TRIBUTE.

The following was tendered the deceased by a co-worker in Trinity Church:

"Doctor Lawrance is dead." Such was the message that went forth from St. Clara's Hospital yesterday afternoon about five o'clock and many were the tears shed by men, women and little children, who knew and loved him and upon whose ears and

hearts the sad news fell with unwonted sorrow. Good, gentle, kindly Doctor Lawrence, the man in whom there was no guile; the exemplary Christian gentleman; the devoted soldier patriot; the upright citizen; the gracious parent; the essence of honor and chivalry; the friend of every one in the community, has gone to his rest but is not dead for in the hearts and memory of all who knew him, and the circle of his friends was as wide as the great state of Illinois, he lives and his works follow him.

Not dead, but gone before, leaving the record of an honorable life well lived, a legacy more valuable than all the dross of earthly gold, a treasure above price to his children and all who were associated with him in business or social life; a monument more enduring than cold marble though it should be carved by the most masterly hand.

The State, the City of Lincoln, the Church, has suffered a great loss in his passing but Paradise has gained from earth a prize of inestimable value. We bless God and give Him thanks for the good example and sweetness and faith and purity and love of this saint and pray Him to give us grace "to follow in his train."

EDMUND NOYES.

DR. EDWARD DUNCAN.

After a long and useful life, Dr. Edward Duncan died Monday night, January 28, 1918, at 10:15 o'clock at his home in Jacksonville. His passing came after a ten days' illness with bronchial pneumonia, although for a considerable period he had been in weakened health. Dr. Duncan came to Jacksonville in 1876 and was actively engaged in the practice of dentistry until 1907. At that time as a result of injuries sustained by a fall, he gave up active work and in the years following there were various periods of illness.

Born in Beaver county, Pa., August 15, 1838, Edward Duncan attended the district schools there and subsequently was a student at Beaver Academy. When he had finished his course there, for a period of twelve years he was engaged as a school teacher, serving in Pennsylvania, Indiana and Illinois.

August 9, 1862, he enlisted in Company J, 134th Pa. Volunteer Infantry. With the Army of the Potomac he took part in the battles of Antietam, Fredericksburg, Chancellorsville and

Gettysburg. It was given to him and members of his regiment following the battle of Fredericksburg to endure great hardships, as for weeks the troops were without tents or overcoats and the weather was bitterly cold. It was as a result of exposure that he suffered an attack of typhoid pneumonia which later developed rheumatism and hernia, which bothered him all the remaining days of his life. Dr. Duncan's war record was notable in many ways and at the battle of Antietam he was one of four survivors of his company.

After the close of the war Dr. Duncan located in 1868 at Cerro Gordo, where he was engaged in teaching work. Subsequently he entered upon the study of dental surgery, and in 1876 graduated from the Baltimore College of Dental Surgery. Almost immediately after graduation he located in Jacksonville and in a comparatively short time had built up an extensive practice. He was one of the first dentists to use nitrous oxid anesthesia in the extraction of teeth and he was also a pioneer in other lines of dental practice. Dr. Duncan continued actively in practice for more than thirty years and his interest in dentistry did not cease even at the time of his retirement.

The deceased was married March 16, 1869, at Seymour, Ind., to Miss Emily Ruddick, who survives him. Two children were born to them, Helen M., who passed away on May 4, 1900, and Dr. William P. Duncan, surviving.

DR. RALPH R. GREEN.

Dr. Ralph R. Green, a member of the Will-Grundy County, Illinois State, and National Dental Societies, died at Wilmington February 28th, 1918, as a result of burns from an explosion of gasoline. He formerly practiced at Braidwood, Illinois, for years.

DR. D'ELBERT B. MUZZY.

Dr. D'Elbert B. Muzzy, one of Odell's best-known citizens, and a practicing dentist in our village for the past 30 years, died at Sacred Heart Sanitarium, Milwaukee, Wis., on March 15th, 1918, after an illness extending over several months.

The doctor had been in ill health for several years and had been compelled to take a much needed vacation last summer

which he spent with his mother and other relatives in Iowa. Returning to Odell in the fall he planned on again taking up his work as his son, Leo B. Muzzy, has entered the war and was in service at Camp Pike, Arkansas. The doctor found his health impaired to such an extent that he had to give up his labor and about six weeks prior to his death he entered the above sanitarium.

The doctor was born in Granville, Illinois, on September 19, 1857, and died in his sixty-first year. He left surviving him his wife, a son, Lieutenant Leo B. Muzzy, now located at Scott Field, Bellville; a daughter, Beatrice, of Odell, and three grandchildren living in Odell.

The funeral was held at the home place in Odell on Sunday afternoon, March 17th, 1918.

The doctor was a member of the local Masonic order, also of the I. O. O. F. lodge of Odell, and of the McLean County Dental Society. The floral offerings were numerous and beautiful, showing the high regard our people had for the deceased.

Interment was made in the family lot in Union Cemetery at Odell.

All of which is respectfully submitted.

F. F. BROOKING,

J. W. DACE,

C. B. SAWYER, Chairman.

LIBRARIAN'S REPORT.*

DR. G. H. HENDERSON, CHICAGO.

To the Officers and Members of The Illinois State Dental Society.

Ladies and Gentlemen: The Executive Council gave me permission in January, 1917, to have the volumes in hand at the Secretary's office of the transactions of our society, which included from that of 1897 to date, sent to the Lincoln Library at Springfield, and this was to be the start of a library for our society. Dr. William Bebb of the Northwestern University Dental School gave me seventeen volumes of the issues previous to that. After considerable work and with the constant assist-

*Read before the Illinois State Dental Society, May, 1918.

ance of our genial secretary and his official bulletin as an advertising medium Dr. Robert E. Cockrell of Alton presented me with the remaining copies, with the exception of a supplement which was published in 1876. There is no possible chance of getting this supplement, as I can only find four copies anywhere. Dr. William Bebb, Dr. Edmund Noyes and Dr. Arthur D. Black have each a complete set and I understand there is one in California. I know of no other complete sets, although there are several nearly complete.

The only way I could see to get this supplement was to get it made, and after a good deal of thought I concluded to ask our Secretary if his office could get this typewritten for me. In a day or so, back came the word that Miss Grace V. Alloway, his assistant, would copy it for me, if I could get Dr. Noyes to allow the use of his copy. This was arranged and I have the book here and it is one of which I can feel justly proud, as all it cost our treasury was the paper and binding, and it is surely a work of art, and a special vote of thanks from this Society is due Miss Alloway for this work.

On account of the scarcity of especially the early volumes of these transactions, it is my belief that they should be kept in some secure place and I am going to place the responsibility of the care of these early copies squarely up to the Executive Council, for not only the present but the future care of this valuable set of books. That was the reason why our President asked me to report to this society and to bring these books here, so that you will all know we have a real set.

You are all welcome to examine them at your leisure.

PHOTOGRAPHS.

On the advice of our Executive Council members, living in Chicago, I made arrangements with The Walingier Co., photographers at 37 South Wabash avenue, Chicago, to take the photographs of any or all of our members who would come there for them. They agreed to save a copy of each one for me and to give to each member a photograph free. They were to receive the benefit of our Bulletin as an advertising medium in each issue, and our Secretary has surely done his part in this work, as you all know.

When I took the office of Librarian two years ago I received two albums containing one hundred and sixty-three' photographs.

After looking them over several times I thought I might get enough photographs to get a complete file of all the past officers of our society. When I considered the value of some of these old-time photographs I was anxious to get others, until now I have before you five albums.

The one labeled "Present and Past Officers of The Illinois State Dental Society" has nearly a complete list of all the past officers.

Every president is there placed according to his year of service, excepting Dr. C. Stoddard Smith, and I was promised his photograph, but at the last moment it did not appear. As it is included in a list of others which grace a great many offices in Chicago I intend to have Walinger make a copy from one of these and I will have it next time we meet.

Dr. J. F. F. Waltz and Dr. William H. Taggart both promised me a photograph and at the last minute neither of them appeared.

When I get these three I will have every President from 1865 to date.

Dr. A. C. Van Sant, our first President, will be in Chicago shortly and intends to have Walinger make another of him. He will be 86 years young on July 4th next and has been the founder of the touch system of typewriting.

Of the Vice-Presidents I am short Drs. Kingsley and Edwards, which may be hard to get. But Drs. McCann, Hoover, Welch and King should be easy.

I have been promised one of Dr. Park, and when I get one of Dr. R. J. Hood I will have all the secretaries.

I have all the Treasurers but Dr. Babcock and his may be hard to get.

Among the list of Librarians I lack Drs. Truesdell, C. O. Dean, Ormsbee, McMillan, Don Stocker, and Kirby.

I will have at our next meeting, I am sure, all but perhaps six of these, when we can have a complete file with these exceptions, and I ask every man present who can get one or all of these to please assist us in this matter.

Drs. Kingsley, Edwards, C. O. Dean, Babcock, Truesdell and Ormsbee will complete our list.

These albums are made on the loose leaf plan and at any time a new leaf can be inserted and additions made as they are needed. The members are arranged in alphabetical order so that any one can find a photograph immediately.

I have tried to get a photograph of all our members who have enlisted in our army and you can see how well I have succeeded, and I ask all you men coming from down state to see that all enlisted dentists who are members of our Society send me a photograph. I have also tried to get photographs of those who served in either our civil war or in the Spanish war, but I have in this list only one of Dr. E. B. David, who passed to his reward during the past winter.

On the back of a number of the photographs of the members I found the following verse, which I quote, as it expresses very neatly my sentiments:

“When other men our lands will till—
When other men our streets will fill,
And other birds will sing as gay—
As bright the sunshine as today,
A hundred years from now.”

As a learned profession we as individuals owe something to the future and some of us may not get our photographs in any other Hall of Fame if we neglect the opportunity to leave our professional followers our photograph. When we consider the reputation of such men as Van Sant, McKellops, Barrett, Harlan, Black, Haskell, Pritchett and scores of others who were proud to claim our society in membership and who have left us their photographs as a memento of their past association with us, am I asking too much of every member of our Society to get me his photograph? The Executive Council appointed a committee who were to assist me in getting these albums and with their advice we have here five albums and I have still another one at home, and spaces for over 1,100 photographs.

Let us see to it that before next year every member will be included in the album list.

The Walinger Company will continue to take your photograph for this next year and at the National Meeting in Chicago

in August he will be prepared to take all who appear at his place of business, 37 South Wabash avenue, Chicago, and let us see to it that all appear.

This morning Dr. Arthur D. Black has handed me a bundle of the early copies of The Bulletin and these with what we now have will make a complete file of the Bulletin to date. These will be bound and included in our library. This makes complete everything our Society has ever published.

Mr. President, I move a vote of thanks be sent from this Society to Dr. Bebb and to Dr. Cockrell, who donated these valuable books to us, and also to Miss Grace V. Alloway, who so kindly made the above-mentioned supplement.

Personally I wish to thank the Executive Council and all the members for their many kindnesses and wish all had done as I wanted them to and sent their photographs.

PRESIDENT'S ADDRESS.*

BY DR. DAYTON DUNBAR CAMPBELL, KANSAS CITY, MO.

Mr. Chairman, Members of the Missouri State Dental Association, Honored Guests:

This address is not to be a long one; but no consideration of brevity could induce me to forego an expression of appreciation for the high honor this Association has conferred upon me in electing me to its presidency. Since the day in 1902 when I attended my first meeting of this organization, I have acknowledged my indebtedness to it and each successive session has increased that debt. During those first years of practice, any efforts of mine that may have been worthy of commendation were due, almost without a single exception, to the inspiration and encouragement of Association men. It is, therefore, with added pleasure that I express to you the fullest measure of my appreciation for the honor I enjoy in being permitted to preside at

*Read before the Missouri State Dental Association at Columbia, Missouri, April, 1918.

the sessions of this, the Fifty-third Annual Meeting of those who are responsible for the advancement of the dental profession in our state.

The genuineness of this honor is further indicated by the hearty co-operation that has been given by members of the various committees and especially by the Executive Council in an endeavor to make the sessions of this meeting the most interesting and profitable in the history of our organization. I am deeply sensible of the compliment paid to me this morning by the presence on this platform of those past presidents ready to render active support and in every way to uphold the hands of the officer chosen to fill an office whose duties they most fully realize. What an inspiration to an incoming President it would be to know that all past presidents were officially constituted an advisory board!

All committees have co-operated in splendid spirit and with specific resolve to make, in the sessions which are to follow, concrete practical contributions to the working equipment of the active progressive dental practitioner. Academic theory, scholastic niceties, speculative possibilities, research probabilities, together with the vague and the visionary have been largely avoided. We believe that this distinctively Clinic Meeting will meet with the approval of all men who come here hoping to be able to do better work the next day after they return to their offices, and that it will at the same time commend itself to those who have time and inclination for excursions into the ethereal blue.

Since it is one of the prerogatives of a President to present recommendations and offer suggestions calculated to enlarge our visions of, crystallize our conceptions with reference to, or make definite progress toward a more nearly ideal organization than the one over which he presides, this I shall proceed to do. And I have the temerity to make these recommendations and offer these suggestions notwithstanding the time-honored and almost sacred custom of embalming these through the medium of a committee report. I proceed, buoyantly, hoping against hope, that the coming year may see some of these suggestions functioning vigorously in the interests of a growing dental association worthy of our state.

No state in the Union has made more marked educational, industrial or financial growth than has the one in which you and I reside. Few commonwealths may boast a city of such magnitude as we to catch the first rays of the morning sun and look with satisfaction to its gateway on the west; no other is distinguished by two Federal Reserve Banks within its borders. Missouri has men of affluence, and men of prominence in their respective professions—dental, legal, medical—men who are also leaders in national affairs. It would naturally follow that the dentists of our state, banded together in the Missouri State Dental Association, should be a significant Society compared with similar bodies in other states. It would follow naturally—but does it actually?

What about our growth? In 1909, on account of our reorganization and vital articulation with both National and District Societies, our membership was greatly increased, and since that year we have steadily increased from — to a roll of — at the present time. But when we consider that our dental population has increased to 1,850 men and that of these at least 1,600 should be identified with us, a net increase within a decade of not more than 300 added to our roll surely reflects no unusually brilliant lustre on our banner of achievement. Furthermore, it is necessary to recognize the fact that our greatness in this respect has not resulted by reason of these being born into our Association but because membership has been automatically thrust upon them by the component societies in which they have become truly interested. If this is true, then it is incumbent upon us to make more attractive and more effective the societies upon whom we depend for growth.

To this end, I should like to recommend that a State Supervisor or State District Manager be elected by our Association as a whole. While in all of the societies worthy and very competent men are elected to the various offices, many of them have not had the experience and are often lacking in the kind of initiative required to secure an essayist-clinician who can "pull" the membership. This supervisor need be given no authority except that delegated to him by each society to arrange for an essayist-clinician. He would be able to arrange a schedule whereby the dates of the component society meetings would fol-

low successively, and thus reduce the expense to a minimum while providing the essayist with an honorarium to justify him in leaving his practice for the two weeks necessary for the round.

Further, while realizing that it is not characteristic of this Association to inaugurate any marked reforms or try out new plans, I know that we are in position to profit through the experience of societies in our neighbor states. Oklahoma, Kansas, Iowa and Nebraska each has a Quarterly or Bulletin. The lack of such a common medium, together with the recognition of a supervisor constitutes our most urgent need. In fact a Bulletin will contribute largely to the success of his undertaking as well as emphasize the value of his task. The Quarterly or Bulletin need not be as pretentious as a journal nor be filled with commercial advertising, but it should contain a full report of our sessions, including papers, discussions, committee resolutions and other matter of interest to the membership. The papers when published would not then appear sandwiched between a page of forceps on one side and sticky wax ad on the other. It would serve to announce the meetings for the following year and to advertise them effectively. Heretofore we have scarcely let it be known in advance what was to take place at our annual sessions. Why not publish the reports of committees and have the President's address in printed form before you come to the meeting? This Bulletin will guarantee a saving in printing and in the mailing expense. A live editor could create an interest in our Association and would succeed in making noncooperating dentists see the value of participating in the advantages of such an organization. Accordingly the Bulletin should be sent to every ethical practitioner in the state, whether a member of the Association or not. The editor should be allowed the expense of a stenographer, only while engaged in the preparation of copy. Bulletins may be mailed for one cent a pound, while postage on a single postcard costs two cents.

In providing the expenses of our meetings in the past, the Exhibit Committee has been expected in keeping with precedent to obtain an amount from the sale of space sufficient to balance our expenditures. Each year, however, I have been increasingly obsessed with the idea that our Association ought not

to look to the men from whom we purchase our supplies to furnish our educational features. Most of you will grant, I believe, that it is more in keeping with professional dignity to plan our meetings and then invite exhibitors as adjuncts rather than to depend upon them to assure success. At any rate, with the approval of the Executive Council the Exhibit Committee has this year inaugurated this plan, and with your approval it will, no doubt, be established through the years to come.

If we did not make changes in our business methods to compensate for the introduction of this feature, our annual income would be materially reduced. Our Constitution and By-Laws published in 1910, provided annual dues of two dollars per member to defray our state expenses. Until the present year, one dollar of this two dollars has been passed on to the treasury of the National, and accordingly we have been deprived of some four or five thousand dollars during this period. This year each member pays his annual dues to the State Association and in addition pays for his membership in the National. We shall therefore receive for state expenses double the amount we have received in each of these previous years.

As a final recommendation but one, I recommend that there be secured at each Annual Meeting a certified public accountant who shall present a statement of our financial affairs, so that the year's term of service may, with the exception possibly of a few details, be closed before the gavel is passed on to the newly elected men.

Finally, believing the old adage that example is better than precept and that a dentist should practice what he comes to an association to preach, I recommend as the most effective badge to enable the public to distinguish the attendants at a meeting of the dental profession, something which some of our members seem to count as of little consequence—namely, two rows of cleanly, well-kept “ivory-keepers of the gate.”

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-FOURTH
ANNUAL MEETING, BLOOMINGTON,
MAY 14-17, 1918.

DISCUSSION OF LIBRARIAN'S REPORT.

DR. C. N. JOHNSON (Chicago):

I know something of Dr. Henderson's work, and it is worth a great deal to every member of this organization. We have something now that we have never had and something that, if placed under the care of the Executive Council, will be a memento to the early days of this association, which means much now and will mean more fifty years from now. I move a vote of thanks to our librarian.

Motion was seconded and adopted unanimously.

DR. EDMUND NOYES (Chicago):

This society owes a very great debt of gratitude to Dr. Henderson for all he has done in this matter. I have been in consultation with him a good many times and I know something about how much work it has been, and it is greater than we can appreciate. Perhaps I might be allowed a personal word. I was announced as one of three or four who have complete sets of the Illinois State Dental Society Transactions. I did have, but for some time past I have not had the pamphlet for 1870. It stood for a good while in my library next to 1871, but for sometime past it has not been there, and whether I loaned it or whether someone thought it valueless and threw it away, I do not know. I mention this in the possible hope that somebody here can tell me where I can find another.

DR. G. H. HENDERSON:

I think I have one and if I have I shall be glad to give it to Dr. Noyes.

DR. ARTHUR D. BLACK (Chicago):

Possibly the members of this society will be surprised to know this is probably the only State society in the country which has published its transactions over so long a period. I think there is not another State society in existence which has kept up the continuous

publication of its proceedings, and therefore we are, I believe, the only State society which can show intact all of the papers and discussions which have been presented since its organization. The supplement which Dr. Henderson referred to was prepared when Dr. Koch was secretary during the early years. He took down not only the minutes, but the principal items of discussion in long hand and wrote them out afterwards and then had them printed. So we are indebted to Dr. Koch, who foresaw the time when they would be of value and preserved the records of the early years for us. These records, together with the index of these proceedings for fifty years, which was published in 1914, gives us certainly a much better record than any other similar organization in this country.

REPORT OF COMMITTEE ON BLACK MEMORIAL.

DR. T. L. GILMER (Chicago) :

I regret that Col. Logan, the chairman of the committee, is not here to make this report. The full committee, with the exception of Dr. Blair, has had a number of meetings in Chicago. These meetings were impromptu, because we never knew when Col. Logan would be there, therefore, there was insufficient time to notify Dr. Blair so that he could reach Chicago in time for the meetings.

Two sculptors made models for the committee. The committee, not feeling itself sufficiently versed in art to decide on the merits of the models presented, appointed a jury, consisting of Lorado Taft, sculptor, Charles Hutchinson, president of the Art Institute, and Charles Francis Brown, painter, to decide on the merits of the models. They decided upon the model offered by Mr. Hibbard, a Chicago sculptor of note. The committee and the family of Dr. Black examined the model and they are satisfied with it. The statue proper is to be bronze. It is one-third more than life size and rests on a base of light colored granite. It is a very imposing statue and I think all will be pleased with it. The likeness to Dr. Black is exceedingly good. The sculptor has promised that the statue will be ready for dedication August next, when the National Dental Association meets in Chicago. The committee has asked the Park Commissioners to permit the placing of this statue in Lincoln Park, Chicago. They have not decided yet, but we hope for a favorable decision, since the work, independent of the character it represents, is worthy artistically to rest in this beautiful park.

The amount of money raised for it is almost sufficient, although

if there are friends who have not as yet contributed who wish to do so, their contributions will be appreciated, be they large or small.

(Since this report was presented consent has been obtained from the Park Commissioners for the placing of the Black statue in Lincoln Park.—*Editor.*)

MISSOURI STATE DENTAL ASSOCIATION, FIFTY-THIRD
ANNUAL MEETING, HELD AT COLUMBIA,
APRIL 1-3, 1918.

DISCUSSION OF PRESIDENT'S ADDRESS.

DR. BURTON LEE THORPE:

Mr. Chairman, Dr. Campbell, and Ladies and Gentlemen—I consider it an honor to be asked to respond to the lofty sentiments and recommendations of our president. I have enjoyed very much his remarks and am glad, as you are, to be able to meet there in this beautiful city, the seat of our great university. I know you as dentists have great influence with your *clientele* and I want to ask you to use your good influence in explaining to your patients the urgent need of an increased appropriation from the legislature to support this great institution of learning. This great university has done a splendid work. We of “the university of hard knocks” in which we received no honorary degree, appreciate it very much. I have talked to a few great men of the state and with many middle class men, and they are all highly pleased with our university and its talented president, Dr. Ross Hill.

There is another reason why I like to come to Columbia, because it is the den of the “Missouri Tigers,” who have put this state on the athletic map.

I asked Dr. Digges this morning what there was in this community to recommend the town, besides the university. He said very modestly, “The air is very stimulating.” That must be true for that’s the only stimulant I have run across since I have been here. A few years ago, one of Missouri’s greatest men, Mark Twain, born at Florida, Mo., and spent his boyhood at Hannibal, came to Columbia to receive the honorary degree of learned doctor of laws, from this university and I wondered if he had Columbia in mind when he uttered that famous epigram, “Heaven for climate, but hell for company.” (Laughter.)

We have all received inspiration from this society, and I will never forget when I first came to this association as a boy, dentally speaking, my "shoes were too full of feet." I felt as Bryan did when a boy, whom some of you may remember, years ago he ran for the presidency and I believe, like Roosevelt, he is running yet.

Coming from New York years ago on the Lackawanna route, I formed the acquaintance of Bryan.

He told me a story of when he first went away from home to school. He was embarrassed because his coat sleeves and trousers were so short and he wrote his father to send him money to get some longer trousers.

His father answered saying "the world won't judge you by the length of your pants but by the brains you have in your head."

I thought I knew *all* about dentistry, but I soon learned I knew nothing about it. I came to this association feeling lonesome and ill at ease. I was greeted so cordially by some of the men who were locally prominent, and who have since attained national prominence in our profession. I shall always feel grateful to those men who gave me the cordial welcome they did and I want to ask you older men of this association to give the young fellows the glad hand and a hearty welcome. You don't know what a lot of good it does them and how they will remember it in years to come.

I disagree, however, with the president's thought that Columbia or any other small town is beneficial to our association as a meeting place. Columbia is especially inaccessible to our membership. From the point of attendance and "pep," both so necessary to make a meeting successful, in my time the meetings at Louisiana, Sedalia, Jefferson City and Joplin were failures. The year the speaker had the honor of serving this association as president, 1902, in my annual address I recommended that the association alternate between Kansas City and St. Louis, both of which cities being so accessible by railroad, each having a large number of resident dentists and a fine territory to draw from, besides each having two dental schools that gladly furnish clinical equipment and patients so necessary to make the meeting successful. This is still my opinion for the good of the society.

In my opinion, also, for the good of the society, as I know it is the opinion of many of you, a dental Bulletin should be started.

For years, while the *Western Dental Journal* was the official organ of this association, I wonder if you really appreciated what a blessing that journal was to Missouri dentistry, and if you ever expressed your appreciation to Dr. R. I. Pearson of the past, and the Hettinger Brothers of the present for the valuable aid they have rendered our association. I did not really appreciate its value until that journal went out of existence a few months ago. That is one great trouble with us in this life: "We do not miss the water until the well runs dry."

I have attended many dental meetings in the different states throughout the country and of late years they have all had clinical lectures with the demonstration idea. People want to be shown and not told about methods. The best meeting Missouri ever had was the Tri-State meeting at Kansas City three years ago. It seems to me as an observer, that Missouri is lagging behind the times, that we are not up in front with the state associations around us. It seems to me there must be something wrong with us. We have too many drones and slackers. You go to any of the associations in the adjoining states and it is surprising to witness the attendance they have and the fine programs offered.

The president's suggestion about the association losing five thousand dollars, only collecting one dollar dues instead of the two dollars the constitution calls for, I cannot understand the reason of that. Dr. McCue just told me a few minutes ago that there are 2,950 registered dentists in Missouri, and about 1,900 practicing. There is something wrong with us that we do not get more men in our component societies which means into our state association.

The entertainment of this association should be provided for gratuitously by the local dentists where the meeting is held, or each member present should pay his *pro rata* for entertainment, as is done in most other associations. I am opposed to taxing our long-suffering friends, the dental dealers, as we have in the past. It is about time the members of our profession do their share financially instead of that repeated holdup of the dealers.

The president's recommendation of each dentist having thorough prophylactic treatment frequently, and especially before attending a dental meeting is fine advice. Personally I never thought any one with a dirty mouth could be convincing in an argument.

Some months ago I gave a celebrated orator a course on prophylactic treatment and I marveled how such lofty sentiments and beautiful phrases could come from such a filthy mouth. In accordance with this recommendation of the president, every dentist should preach prophylactic treatment, also personally practice it. The bath tub, tooth brush, and tongue cleansers are almost as great civilizers as is the church and school.

You know that a few years ago the dentist was held up as a boogy man by exacting mothers to frighten their unruly children with, and later on the dentist was referred to in a sort of sneering way, that he "is only a dentist," and we did not have much social standing until the last five years, the dentist has been recognized in every community as having an equal standing with practitioners of theology, medicine and law and quite as necessary as they, and I tell you gentlemen, you have no cause to be ashamed of the fact that you are a dentist, from the work you have done in these past five years in the diagnosis of various diseases you are competent to find resulting from your expert knowledge of your profession.

Another thing that has materially benefited our standing in the profession has been the recent work of the few men in behalf of the National Dental Association in getting an equal rank in the army for dentists as have members of the medical corps. That has been, in my opinion, the greatest step forward in the line increasing our standing ever made in American dentistry.

A man who has done much to enhance the standing of the army dental corps is the man who so nobly has charge of the corps; he is no other than Col. W. H. G. Logan, president this year of the National Dental Association. (Applause.)

He has done a great work in bringing order out of chaos in the dental corps, and as a profession, each of us is his debtor for what he has done to give our calling caste in the army. Never before in the history of the world has so many petitions ascended on high to the Almighty as during this present crisis in Europe and every man, regardless of his religious beliefs, if he is a humanitarian at heart, surely must offer a supplication each night or day for peace and mercy and in that don't fail to include "God bless Col. Logan for the good work he has done and is doing for our profession."

I cannot close my remarks without a personal reference to

my fine friend the President, whom I met twenty-five years ago this last month when he was eleven years old, in the village where I located to earn a living between the time of my freshman year and my graduation. He was a husky little fellow with a foot large enough to have worn my shoes had he wanted to; but the swift fleeting years make many changes and hundreds of others today who know of this man's extraordinary work, myself included, would be mighty glad if we had his skill and knowledge in prosthetic art and could exchange places with him and properly fill *his* shoes. In my estimation among the greatest teachers, practitioners, and writers of text books on the prosthetic art today are Dr. George H. Wilson of Cleveland, Dr. Charles R. Turner of Philadelphia, Dr. Rupert Hall and Dr. G. Walter Dittmer, both of Chicago; Dr. W. E. Cummer of Toronto; last but by no means least is Dr. Dayton D. Campbell, of Kansas City. You know it was a Missouri dentist, Dr. J. W. Green of Chillicothe, a member of this Association, who did more to put prosthetic dentistry upon the map than any other man in the past. He was one of the foremost teachers in dental prosthesis and one of the first to give clinical lectures before dental societies, and wherever he lectured he always had a flock of men around him listening like "flies swarming around a molasses barrel." He was a quaint, sincere, and interesting character and wore an upper denture with a hole in the palate as big as a twenty-five cent piece which he had constructed for himself with a suction so tight he could chew beefsteak with it. He set the pace that others have followed and improved upon, and I am sure each member of our Association must be proud that two of our fellow members, Dr. Green and Dr. Campbell, have attained the high place they have in the prosthetic art. (Applause.)

DR. D'OENCH:

It is customary to appoint a committee on the President's address, and before appointing that committee I want to take over some of their work. In this case, this is to be called an "embalming committee," as the President denominated it. The Vice-President, you know, has very little to do, so I want a job. I want the "short-pants" fellows to be referred to me, and I will be glad to take care of them. There was one word used, that

I do not want to accept as applied to dentists, that of being "slackers." I want to say there are no slackers in the Missouri State Dental Association. I do not believe Dr. Thorpe referred to us as slackers in the sense we usually hear the term used. I believe that the dental profession is like any other group of real loyal American citizens; they will do anything for any live cause if you show them the way.

On this committee I will appoint: Dr. Edouard M. Hall, of Kansas City; Dr. H. F. Hageman, of St. Louis, and Dr. Denny B. Beattie, of St. Joseph.

DR. CAMPBELL (Resuming the Chair):

I noticed particularly that there was no very hearty applause when Dr. Thorpe suggested taking our meetings to St. Louis and Kansas City, and that was gratifying to me as I still believe that the smaller towns, perhaps one a little more accessible than Columbia, are well adapted as places of meeting.

The most unsuccessful meeting I ever attended was in Kansas City in 1890 or thereabouts, when we had two eminent dentists from out of the city that came and taught us exactly how to put in fillings and demonstrated how to prepare a cavity. I was in the line that went by one of those men, and I asked him some such foolish question as "Why do you always put your gold in vinegar before inserting it in the cavity?" He looked over his "specs" in a supercilious sort of way and went on back to work and never answered my question.

That so depressed me, I made a firm resolve, that if I ever got to a point in life where someone would compliment me by throwing a question at me, it would make no difference what the question was, I would try my best to give him a kindly look and say "That was a good question," and answer it as best I could.

Springfield, Missouri, was one of the grand places for holding a meeting, and we had one of the best meetings and the largest attendance we ever had. The meeting at Joplin was also one of the successful meetings in the history of the Association. The Tri-State meeting was the best ever held in the United States any place; but the Missouri dentists did not deserve much credit for it. We did not have enough men there according to our membership. Kansas had a greater per cent of her men

there than we. The reason it was one of the biggest dental meetings we ever had was because we had one of the biggest men in the United States as an organizer, Dr. C. R. Lawrence, of Enid, Oklahoma.

I wanted to say something in my address concerning what the State Board has been doing during the past year, but hesitated to do so for fear of making the address too lengthy. Through the activities of the members of the State Board, Missouri now has the most efficient dental law of any state, and it is being copied by other states. We recently have had trouble with those men who were the "successors" of the "Painless" advertisers, and that part of the law relating to the successors of those advertisers has been upheld, so that they cannot use the same office for the same purpose that the "painless advertiser" has used it. We should all feel grateful to our good Governor for the fact that he signed this bill in the presence of a number of those "advertisers."

I am very grateful to you for your cordial reception of this address, and for the frank discussion. I want to reiterate what I have repeatedly told some of you older men in the profession, that their help and influence has given me a great incentive to do something for the association as a whole, and I want you to know that I appreciate what you have done, and I further appreciate the fact of your being here at this meeting and backing me up, so to speak, in making this meeting a successful one. I thank you. (Applause.)



THE DENTAL REVIEW.

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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THE EXALTATION OF A NATION.

Amid all the clamor, and din, and distractions, and charges, and countercharges, and innuendos, and blunders, and profiteering connected with the war, there develops one supreme thought which does not seem to sufficiently impress itself upon the minds of the unthinking mass of the people. Notwithstanding the great number of mistakes which are inevitable in the launching of any new enterprise, the fact stands out in bold relief to those who wish to look below the surface of things that this nation is undergoing a profound change so far as its responsibility, and its outlook upon life is concerned. We have been called a nation of "dollar chasers," but—dismissing the fact that it was not altogether an unfortunate thing to have some dollars in this emergency—let us suggest that this nation today is thinking vastly more of other things than it is of dollars. Our young men, brought up as many of them were in environments of luxury and ease—an experience well calculated to sap the mainsprings of stamina and character—have suddenly cast off the swaddling clothes of their pampered existence, and embarked on a sea of serious endeavor with a spontaneity never before witnessed in the history of the world. In every national crisis there are slackers, but there were never so few relatively to population as there have been in this instance, and never so many men, young and old, who voluntarily jumped into the breach and put their best foot forward. Everywhere, from the cabin to the palace, men have stepped forth promptly, and offered their services to their country. We have the spectacle of men of refinement and means, long past middle life, working for the Government as they never worked before, slaving as they would never have slaved for themselves, subject to rules which under ordinary conditions they

never would have accepted, and doing it all willingly, not for money, but for devotion to their country. They receive the munificent sum of one dollar a year for their services. Does this look like a nation of dollar chasers?

We see other men accustomed to luxury, men more than fifty years of age, who all their lives had had servants to wait upon them, now in training camps—voluntarily so—shining their own shoes, making their own bunks, cleaning their own quarters, and even blacking their stoves. They work harder than a day laborer, drilling, marching, digging trenches and other manual exertion, till they are so dog tired they can hardly drag one foot after another, and yet they do it all with a smile on their lips and a song in their hearts.

Talk about consecration to duty, but when the millionaire's son and the coalheaver's son march side by side, sharing the same environment and doing the same service each with his eyes on the Stars and Stripes, and thinking only of what it represents, then we have an exhibition of fraternalism and equality among men such as has seldom been witnessed even in this country where all are supposed to be "free and equal."

Take a young man full of life and with not a care on his mind, put him into the service of his country, send him to the front, and have him write home just before the battle in which his life is to be wiped out—as if he had a premonition of what was to happen—*"it is an investment, not a loss, when a man dies for his country,"*—take this, and you have an example of the loftiest patriotism that ever beat in a human breast. And this is only one of the many incidents which are happening every day, happening to men, young and old, who up to this time have never thought in terms of war and who have been charged repeatedly with being merely money-getters and money-spenders.

And the women—pampered and petted as are no other women on the face of the earth, brought up to idleness and indulgence of all sorts, coddled with love and shielded with care, living a life of luxury, ease, and irresponsibility—what of the women? Yes, what of them? They have risen in their might like the heroines of old. They have put the luxuries of other days behind them and have launched out into a life of active endeavor and devotion to duty

such as has seldom been witnessed anywhere in the world. God bless the women! They have smilingly sent their sons and sweet-hearts to the front—sent them with brave farewells, and hugs of the heart, hiding their emotions for the subsequent quiet of their closets, and turning to their work as their only solace in the hour of their deepest trial. Not a murmur from any of them!

And the boys on the field of battle, set and firm, with a determination to do their part in this great cataclysm, knowing full well why they are there and the issue at stake, knowing that unless they “make good” the world will not be a fit place in which to live, and knowing also that the eyes of humanity are on them today—these boys with hearts of oak and nerves of steel, ready for whatever fate may bring them in the surging fortunes of war, and knowing the infinite chance they take—these boys go forth with their faces turned toward the light, with never a falter and never a doubt, confident that in the ebb and flow of battle, in the flotsam and jetsam of the terrible tempest in which they are thrown, whether they live or whether they die, the cause for which they fight will never be lost, but that on the final summing up, when the day succeeds the night, the pale gray dawn of the early morn will show the flag for which they fight still waving in the breeze.

These—all of these—the American people, are consecrating themselves to the principles of democracy in a manner which constitutes as nothing else has ever done the real exaltation of a nation.

WELCOME TO CHICAGO.

The selection of Chicago as the place of meeting of the National Dental Association for 1918 was a distinct compliment to this city; and the dentists of Chicago wish to record their appreciation and to extend to the profession a cordial welcome. Never before has the Association faced a situation with so much significance as the one which confronts it today, and therefore this promises to be one of the most important meetings ever held. Naturally war measures must assume precedence over other matters, and yet in the terrible turmoil of war the purely scientific phases of our profession will not be overlooked. Everything points to a record meeting, and the profession of Chicago places itself at the disposal of the visitors

in every way possible for their comfort and welfare. We ask those in attendance to make known their wants, and they will be supplied.

THE EDITOR'S DESK.

AN OPEN LETTER TO THE ARMY DENTIST.

My Dear Boy: You are an integral part of the great moving machinery of war, and you are doing a wonderful work. Upon you rests a responsibility such as has rested upon no other member of the profession since dentistry existed. You are not intrusted with the destinies of a nation, but you are with the destinies of a profession. To you it is given to make or mar the fair name of dentistry in the estimation of the military, and at the present time this means in the estimation of the Government, and in the future it means in the estimation of the people at large. Dentistry is being tried in the balance, and you happen to be the medium through which the test is being made. Take this home to your heart, and look well to your laurels, or rather to the laurels of the profession which you represent. Every untoward act of yours militates against the reputation of your calling, just as every kind, unselfish, and noble deed helps to place the whole profession on a higher plane.

You have made mistakes and you will make others. Do not pretend that it is otherwise. The infallible man never lasts long—his home is in heaven; though I greatly doubt that there are many of his class who ever really reach there. When I intimate that you make mistakes I merely mean that you are human and you would not be of much service in your present capacity if you were not human. Try to make as few mistakes as you can, but do not remain idle through fear of making mistakes—that would be the supreme mistake of all.

You are sometimes called upon to work under the greatest difficulties. Never mind. Do not waste your time in lamenting. Remember that the Government is doing the best it can in a game that is entirely new to it. This country has not for generations been accustomed to think of its affairs in the light of war, and it is a difficult game to learn. The marvel is that it has done as well as it

has. Never mind, even if you are called upon to work in rooms with chinks in the walls or a bit of rain leaking through the roof. Do your work cheerfully, and as perfectly as you can. Learn to show the greatest consideration for the soldiers you serve. They are human just like other folks, and they appreciate kindness and professional care. Moreover they are fighting your battles for you in the muck and mire of the trenches, and where the shell-fire is the fiercest. Take the best care you can of them, and keep them fit for service. They will reward you by giving a good account of themselves when it comes to the thick of the battle, and you will have the satisfaction of knowing that you have contributed to their efficiency.

Never forget for a moment that you are a professional man, with the dignity of your calling to maintain; not in a pompous, overbearing way, but in the way of selfsacrifice and devotion to duty. You were made to serve and service is the highest attribute of humanity. The more good you do in your army work, the greater credit will you bring to the calling which you represent. We are all watching you—watching with anxious eyes to see that you take full advantage of the wonderful opportunity which is yours. Never again in your generation or mine will there be another war like this—never again the same chance to show the mettle of which you are made.

I am proud of what you have done up to date and I thank you as a member of the profession; but to say that I am satisfied would be far from the truth. I shall never be satisfied so long as there is one advance to be made in our calling, whether military or civil; and I never expect to see the day when there is not a crying need for advancement. I shall be sorry for you when you get to the point where you are satisfied with what you have done; but, frankly, I shall be more sorry for the profession than I am for you. In a very important way you are at this moment representing dentistry before the world, and my plea to you is that you accept your responsibility in its true significance, and render such an account of yourself that ever after the profession will have occasion to look back upon the present as a fortunate era for dentistry.

With best wishes,

I am, fraternally yours,

C. N. JOHNSON.

BOOK REVIEWS.

THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE MOUTH, being the Second Edition of The Histology and Patho-Histology of the Teeth and Associated Parts. Revised and enlarged. By *Arthur Hopenwell-Smith*, L. R. C. P., London, M. R. C. S., Eng., L. D. S., Eng., Professor of Dental Histology, Pathology and Comparative Odontology, University of Pennsylvania, etc. 345 pages. Price \$4.50. Published by P. Blakiston's Son & Co., Philadelphia, Pa.

This is volume I of an important work by this distinguished author, the second to deal with Pathological Conditions connected mostly with the teeth of man. The present volume is a masterly presentation of the subject of the normal histology of the structures under consideration, and contains illustrative matter of the highest order and the widest range. The chapter on the Dental Pulp is particularly good as well as those upon the hard tissues of the teeth. But in a work of such excellence there is little need to particularize. The book should be in every dental library.

ORAL SEPSIS IN ITS RELATIONSHIP TO SYSTEMIC DISEASE. By *William W. Duke*, M. D., Ph. B., Professor of Experimental Medicine in the University of Kansas School of Medicine, etc. With 170 illustrations. 119 Pages. Price \$2.50. Published by C. V. Mosby Company, St. Louis, Mo., 1918.

This book is at the present time of especial interest on account of the prominence given this subject in our periodical literature of the past few years. The author, a medical man, has naturally looked upon it from a broad point of view, and has brought forth many ideas that it would be well for the dentist to study. He is more conservative than most medical writers on this subject, admitting as he does that brilliant results do not always follow in the treatment of systemic disorders, after the removal of suspicious teeth. It will be some time yet before this question is settled in a satisfactory way, and meanwhile a book like this is to be welcomed into our literature as a means of throwing additional light on a somewhat complicated problem.

QUALITATIVE CHEMICAL ANALYSIS (Second Edition). A Laboratory Manual of Qualitative Chemical Analysis. By *A. R. Bliss, Jr., M. D. Ph. G.*, Professor of Pharmacology, School of Medicine, Emory University, Atlanta, Ga.; formerly Professor of Chemistry and Pharmacology, Graduate School of Medicine, University of Alabama. Second Edition. Revised and Reset. 194 pages, with working tables. Philadelphia and London: W. B. Saunders Company, 1918. Cloth, \$2.25 net.

The National Association of Dental Faculties has recommended this manual as the required text for laboratory instruction in qualitative analysis, which is a sufficient endorsement of the merits of the work.

One very gratifying feature of the book is the fact that the author has conformed to the modern methods of nomenclature and spelling. When the Committee on Nomenclature of the Association for the Advancement of Science suggested some years ago a reformed spelling of technical terms by dropping the "e" in such terms as "chlorine," "chloride," "sulphide," etc., all writers of scientific works should have fallen in line, but many of them did not, and consequently there is much confusion in this class of literature. It is refreshing to pick up a work in which the most recent spelling is employed.



PRACTICAL HINTS

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Finishing Silicate Cements:—A timesaver that I have found in finishing synthetic porcelain fillings: To keep a synthetic filling enclosed in a dam for any length of time when there is other work to be done in the same mouth is unnecessary. Unloosen the dam holder and with ligature tie in the tooth with the synthetic filling; cut away the remaining dam and proceed with any other work in the same mouth.—*L. C. Blackman, Leigh, Neb.*

Protection of Teeth Prepared for Porcelain Jacket Crowns:—This may be done with a thick mix of temporary cement. The cement should be nearly as thick as putty, so that it can be pressed to place with the fingers and held till hard. The surplus can then be trimmed away. This protection should be given whether the tooth is vital or not; one object being to keep the gums away from the shoulder until the crown is set.—*D. N. Lewis, Lake Forest, Ill.*

Removing Silver Nitrate Stains:—Many times even though one may be very careful, a little silver nitrate will fall on the hands of an operator and cause a great deal of discoloration and also discomfort in operating. When this happens, soak the hands in as hot water as one can stand for about fifteen minutes and then very carefully rub the spots with pumice stone. The spots will be seen to disappear without any injury to the part treated. After the black color caused by the dead skin entirely disappears soak the hands in almond cream. Very large spots may require a few treatments at short intervals before the black color entirely disappears.—*Walter E. Whittaker, Malden, Mass.*

Taking a Bite for Crown or Bridge Work:—One of the most difficult items in operative dentistry to contend with is the taking of a satisfactory bite, particularly where the occlusions are close. When

the wax or compound bite is removed it often breaks in two pieces, making it difficult to obtain a perfect cast for the occluding surfaces to be articulated to the crown or bridge about to be constructed, or breaks when placed on the plaster model. Many ideas have been advanced for overcoming this, such as placing a piece of linen, cut about the length and width of the bite to be taken, then placing the wax above and below the piece of linen, taking the bite in the usual manner. The linen holds the bite together and prevents biting clear through. A better and more rapid way of obtaining this result is the use of the Artic-Bite, a nifty little instrument in which all manner of hard, close, difficult articulations and bites can be obtained in two minutes' time without the possibility of a mistake. The inventor of the Artic-Bite is to be complimented.—*IV. E. Beachley, Hagerstown, Md.*

Ten Minute Preparation of Tooth for Porcelain Veneer Crown:—First—Clean rapid cutting stone $\frac{5}{8}$ -inch. Small wet sponge in contact while cutting. Remove all enamel on incisal, labial and lingual.

Second—Separating stone to remove enamel on mesial, distal, run wet.

Third—At corners where enamel remains, remove with Miller's tapered mounted points run wet. Enamel is all removed now up to gum line.

Fourth—Fresh, new tapered cross cut fissure burrs (spiral cut) with compressed air (35 pounds) to blow gum margin away from tooth.

Use burrs with $1\frac{1}{2}$ pounds pressure.

Start cutting $\frac{1}{3}$ from incisal and cut gingivally until burr is buried in tooth structure $\frac{2}{3}$ under free gum margin and then cut laterally around tooth. With cutting done in dentin shoulder will be completed in from one minute to $1\frac{1}{2}$ minutes. Clean, new and sharp tools run at their greatest efficiency—wet or dry, but always cool—means comfort to the patient and satisfaction to the operator.—*A. E. Schneider, Chicago.*

Maintaining Dryness of Gingival Cavities Without Rubber Dam Especially Useful with Silicious Cements:—Cavity having

been prepared with retentive form, apply deliquesced chlorid of zinc, full strength, under the border of gum margin all around the decayed tooth, also under gum margin of adjoining tooth on each side. A suitable cotton wound broach is best for the purpose. It must be done carefully, so as to produce no hemorrhage. Lip or cheek must be held away to prevent contact with chlorid. It is best to keep saliva ejector in the mouth from the beginning. After the application is made the surfaces touched with the chlorid must be at once sprayed, preferably with tepid water, to wash off the chlorid. The momentary contact with the tissues suffices to produce the required astringent effect. Special care is necessary that no chlorid remains in or around cavity, as it would contaminate a silicious filling. A cotton roll is now inserted and alcohol applied to cavity, teeth and gums and all dried with cotton and blasts of warmed air. It will be found that cavity and surrounding tissues are dry and there is no oozing from gum margins. This dryness can be maintained fifteen or more minutes, changing cotton roll if necessary. If the filling is to be silicious, all materials and instruments should be within reach before applying the chlorid. After drying as above, the necessary powders and liquid are placed on slab, mixed, and the cavity filled. Coat filling with cocoa butter and allow time for hardening before removing cotton roll and saliva ejector. It is best to finish the filling a day or more after insertion. If sufficient excess of cement has been used, cocoa butter is adequate protection, as there is not penetration of moisture through the excess sufficient to affect the finished filling. The brief application of chlorid produces no injury. Should any of it get where not wanted, apply plenty of water, which will destroy its caustic effect. Should a slight hemorrhage be produced in working on the cavity, the application of the chlorid as directed will generally stop it, so as not to delay the operation. This method is practicable with all gingival cavities, except those on the lingual surfaces of the lower bicuspid and molars. Therefore also useful in insertion of amalgam fillings.—*Vincent Fischer, Chicago.*

MEMORANDA.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board for the examination of applicants will be held at Iowa City, Iowa, commencing August 26th, at 9 a. m. For further information address the secretary, Dr. J. A. West, 417 Utica Bldg., Des Moines, Iowa.

XI PSI PHI FRATERNITY.

The National Alumni Association of the Xi Psi Phi Fraternity has established headquarters during the National Dental meeting at room No. 218, Auditorium Hotel. The annual banquet will be held in the Crystal Ball Room of the Blackstone Hotel Monday, August 5th, 7 P. M. Members of the Xi Psi Phi Fraternity who expect to attend the banquet please communicate at once with Dr. H. B. Pinney, 25 East Washington street, Chicago.

NOTICE.

The Medical Reserve Corps Drill Corps extend an invitation to all men having commissions in the Dental Reserve Corps and to men in the Medical Enlisted Reserve Corps to attend the drill of the corps on Tuesday and Friday evenings at 8 o'clock in the City Hall Gymnasium, 10th floor.

No expense attached to this. The corps is composed of reserve officers in medical, dental and veterinary branches of the service. Instructions given in drill for the Sanitary troops.

By direction of Commander M. R. C.

(Signed) LIEUT. SCHURMAN, D. R. C.,
Junior Medical Officer of the Detachment.

WINTER EXODONTIA CLUB NUMBER ONE.

The Exodontists of Minneapolis and St. Paul had their first formal meeting at the Minneapolis Athletic Club, May 19, 1918. The guest of honor was Dr. George B. Winter of St. Louis, the author of "Exodontia," and the originator of a new technique for the removal of impacted lower third molars. Dr. Winter demonstrated the efficiency of his system by removing a large number of impactions, at a clinic, the average time employed being less than one minute.

For recognition of his contributions to science the club honored him by naming this, the first organization of its kind, for him.

HENRY B. CLARK,
President.

CARL J. RICE,
Secretary.

C. M. CARR PATENT VOID—UNITED STATES COURT DECREES PATENT ON PYORRHEA TOOLS INVALID.

Dentists everywhere will be interested in learning that certain litigation of great importance to the profession has just terminated. The result is a complete victory for the Dental Protective Association of the United States, which, in carrying out the objects of its charter, successfully assumed the defense of a case brought against one of its members.

The Carr School of Preventive Dentistry and Medicine, assignee of Cassius M. Carr, brought suit against Dr. Austin F. James, of Chicago, in the U. S. District Court for the Northern District of Illinois, Eastern

Division, for alleged infringement of the Carr patent on pyorrhea tools and for unfair competition in trade. On Tuesday, July 2, 1918, His Honor, Judge George A. Carpenter, entered a final decree adjudging as invalid, void, and of no effect in law these letters patent known as No. 1,138,355, issued May 4, 1915, to Cassius M. Carr, on dental tools, and which the patentee purports to exemplify in a set of one hundred and fifty tools, well known as the Carr pyorrhea set. The suit was ordered dismissed for want of equity at the plaintiff's costs.

The importance of the case arises from the establishment of the right of all dentists to avail themselves of instruments of the type described in the patent, in larger or smaller sets, without paying tribute to anyone. The sued on was not a good patent in law, and that its existence could be made, Dental Protective Association of the United States conceived that the patent and was likely to be made, the basis of serious oppression to dentists, especially in view of the numerous suits already brought under it. The suit against Dr. James was one which the association considered to be of that character. The Dental Protective Association has consistently fought to protect its members from unjust and unlawful patent claims, and makes no distinction in this respect between patents for mechanical devices and patents for processes or methods. While its chief obligation is to its members, such results as come from its success in the present case will inure to the benefit of the profession as a whole.

A vast amount of testimony was taken by both parties to the suit, the plaintiff having thirty-six witnesses and the defendant twenty-five. For the defendant a large number of the most prominent teachers and practitioners on the subject of pyorrhea gave valuable testimony.

The defeat of the Carr patent ought to relieve many dentists from the annoyance of litigation which Carr or the Carr school has threatened to institute. The air is cleared and dentists now are justified in treating the patient as though it did not exist.

In passing it may be mentioned that a suit brought by Carr against Dr. Thomas B. Hartzell, of Minneapolis on the same patent was defended by the Dental Protective Association and was also dismissed at Carr's costs.

The association's attorneys are Mr. Percy B. Eckhart, of Chicago, general counsel, and Mr. Luther Johns, of Chicago, patent counsel. We express our appreciation of their very thorough preparation of the case and its successful defense.

(Signed) DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

J. G. REID,
D. M. GALLIE,
J. P. BUCKLEY,
Directors.

PATENTS RELATING TO DENTISTRY.

- 1177706. Porcelain crown remover, John A. Johnson, Chicago, Ill.
- 1178323. Dental instrument, Eldon L. Knox, Coleman. Texas.
- 1177979. Suction holding means for dental plates, Frederick W. Wilson, Willits, Cal.
- 1179268. Operating mechanism for rotary tooth-brushes, Ernest L. Beezley and F. Lane, Mount Pleasant, Iowa.
- 1179317. Dental impression tray, Charles G. Hurrey, Auburn, Victoria, Australia.
- 1179216. Dental appliance, Thomas H. Ragatz, Prairie du Sac, Wis.
- 1179890. Receptacle for dental floss, Seth W. Boynton and W. A. Leonard, Chicago, Ill.

- 1179800. Container for individual tooth-brushes, Archibald M. Carswell, Newark, N. J.
- 1179426. Tooth-brush, John E. Hamilton, Smithton, Pa.
- 1180049. Dental apparatus, Sigmund F. Kohn, New York, N. Y.
- 1180056. Tooth-brush holder, Gabriel Lundy, Madison, Wis.
- 1180745. Dental device, Roscoe W. Upp, Chicago, Ill.
- 1181206. Device for measuring and mixing dental amalgam, Horace E. Basehore and E. L. Kraft, York, Pa.
- 1181975. Artificial tooth, John G. Dettinger, Jr., and F. H. Welker, Philadelphia, Pa.
- 1181862. Tooth-brush holder, sterilizer and dehydrater, Ernest C. Dye, Greenville, S. C.
- 1181795. Dental anvil, George W. Patten, Minneapolis, Minn.
- 1181944. Coloring enamels and the like, Josef Weber, Essen-on-the-Ruhr, Germany.
- 1182150. Blowpipe, James H. Downie, San Antonio, Texas.
- 1182560. Artificial tooth and backing therefor, Harry E. Hall, Scranton, Pa.
- 14128. Reissue, producing backings for artificial teeth, Gustav Holtz, Gouldsboro, Pa.
- 1182376. Tooth-filling impression device, James W. Ivory, Philadelphia, Pa.
- 1183535. Dental drill, Herman E. S. Chayes, New York, N. Y.
- 1183539. Rugae mold, George A. Critcherson, Los Angeles, Cal.
- 1183540. Rugae mold for dental plates, George A. Critcherson, Los Angeles, Cal.
- 1182909. Amalgam mixer, Gustav Holtz, Gouldsboro, Pa.
- 1183467. Tooth-brush holder, John Kirschaum, Waterbury, Conn.
- 1183396. Dental bridgework, James B. Morgan, Davenport, Iowa.
- 1184187. Artificial tooth, Miguel Linares, Alcoy, Spain.
- 1184122. Dental tool, George Parmiter, Buffalo, N. Y., and M. J. McDonnell, Holyoke, Mass.
- 1184048. Tooth-brush holder and sterilizer, Albert G. Tillman, Vicksburg, Miss.
- 1184052. Dental instrument, John W. Turner, Oak Forest, and J. Lend, Chicago, Ill.
- 49085. Design, tooth-brush, Alfred C. Fuller, Hartford, Conn.
- 1184922. Saliva ejector, Leighton C. Brownton, San Jose, Cal.
- 1185292. Retractor for dental surgery, Oscar T. Dean, Seattle, Wash.
- 1184949. Heater for dental vulcanizer, Wm. A. Gwynn, St. Louis, Mo.
- 1185518. Impression cup, Augustin Marcoux, Lewiston, Maine.
- 1170231. Tooth-brush, Bradford B. Flint, Saranac Lake, N. Y.
- 1170333. Mouth extender, Edward Reyer, Scranton, Pa.
- 1169998. Dentifrice, Francis J. Rhodes, Malton, England.
- 1171177. Dental floss holder, John P. De l'Eau, Betteravia, Cal.
- 1170523. Right angle nerve extractor, Adelbert Fernald, Boston, Mass.
- 1170524. Dental handpiece, Adelbert Fernald, Boston, Mass.
- 1170630. Artificial tooth, Thomas F. Glenn, Ardmore, Pa.
- 1170555. Artificial tooth and backing, Joseph P. Morrison, Mount Carmel, Pa.
- 11717368. Dental bridge, George W. Todd, Omaha, Neb.
- 1172109. Tooth-brush with detachable handle, Horace D. Cammack, Crosssett, Ark.
- 1172202. Dental amalgamator, James N. Flood, Denver, Colo.
- 1172079. Toothpick holder, Calen W. L. Vell, Wenatchee, Wash.
- 1172878. Artificial tooth, Edward P. Cressler, Peabody, Kans.
- 1173106. Ready-made adaptable backing for teeth, Gustav E. Fritz, Chicago, Ill.
- 1172792. Tooth-brush, Leo A. Hamel, Brooklyn, N. Y.
- 1172723. Making dental cements, George S. Miller, Chicago, Ill.
- 1172903. Cutting torch or blowpipe, Marion S. Plumley, Pittsburgh, Pa.

1173032. Tooth-brush, Hermann Reiche, Millstone, N. J.
 1172564. Clamp for dental flasks, Alexander Rutan, Blackington, Mass.
 1172486. Strength reinforcement for tooth fillings, Wm. E. Sanborn, Detroit, Mich.
 1173045. Dental articulator, David M. Shaw, Eltham, England.
 1172918. Artificial tooth crown, Charles J. Thorp, Detroit, Mich.
 1172652. Tooth crown, Thomas H. Whiteside, Youngstown, Ohio.
 1173557. Dental chair, Frank E. Case, Canton, Ohio.
 1173509. Swage, John P. Hedstrom, Big Rapids, Michigan.
 1173519. Dental amalgam mixer, Wm. G. Hughes, Pittsburgh, Pa.
 1174016. Dental floss holder, Johnson Kenyon, New Brunswick, N. J.
 1173383. Dental gage for bridgework, Harvey Raymond, New York, N. Y.
 1174859. Tooth and support for same, Frank Z. Hanscom, Chicago, Ill.
 1174886. Interchangeable crown, Harry A. Marx, Port Huron, Mich.
 48666. Design, tooth-brush, Charles Boccia, New York, N. Y.
 1175275. Tooth-brush, Theodore C. Knauff and H. R. Heyl, Philadelphia, Pa.
 1175847. Dental bracket, George J. Vokel, Philadelphia, Pa.
 1176272. Wall bracket, Henry D. Bultman, New York, N. Y.
 1176548. Dental crown splitter, Henry T. Harpin, Windsor, Vt.
 1176176. Treating amalgam, Julius W. Smith, Madison, Minn.
 1176948. Machine for making pins for artificial teeth, James Dimelow, York, Pa.
 1176793. Matrix pliers, Wm. H. Tuttle, Kansas City, Mo.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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THE CIVIL ADMINISTRATIVE CODE OF ILLINOIS
AND THE DENTAL PRACTICE ACT.*

BY FRANCIS W. SHEPARDSON, DIRECTOR OF REGISTRATION AND
EDUCATION, SPRINGFIELD, ILL.

It has been customary to have at the annual meeting of the Illinois State Dental Society a report from the Secretary of the State Board of Dental Examiners. The administration of the Dental Practice Act in Illinois is now under the jurisdiction of the Department of Registration and Education.† This Department is one of nine under what is known as "The Civil Administrative Code." The Code, which was adopted by the Legislature of the State in the spring of 1917, became operative on July 1, 1917. The dominant principle pervading it is that of centralization of administrative functions and localization of responsibility. Inasmuch as efficiency in the enforcement of the Dental Practice Act is, to a large degree, dependent upon the powers granted by the Code, it may not be out of place to consider for a short time this new, unusual and attractive administrative machinery for State government.

The present constitution of the State of Illinois became operative in 1870. Although amendments have been made to it from time to time, its main provisions are substantially as when it was first adopted. The astonishing changes which came in country and commonwealth during a half century of tremendous growth led from time to time to the creation in Illinois of special boards and commissions, designed primarily to relieve

*Read before the Illinois State Dental Society, May, 1918.

†§58. The department of registration and education shall have power:
..... 9. To exercise the rights, powers and duties vested by law in the
Illinois State Board of Dental Examiners.

overburdened constitutional officers from tasks which it was physically impossible for them to perform. In practical experience these Boards and Commissions, eventually more than one hundred and thirty in number, tended to become semi-independent administrative factors in government, each with its own headquarters, officers and equipment. Almost inevitably conflicts of jurisdiction resulted and with them, naturally, much duplication of effort and expenditure.

About ten years ago, the Attorney General of Illinois, in a moment of discontent with existing conditions, gave utterance to an opinion that a satisfactory and effective government in the State could never be obtained until the overlappings of authority resulting from the distribution of the powers of administration among many boards and commissions were ended. This observation was, perhaps, the first definite expression which led to the adoption of what is now known as the Civil Administrative Code.

It was not until the session of the forty-eighth General Assembly, however, that an efficiency and economy commission was appointed. It consisted of four senators and four representatives, who were authorized to make an investigation of all departments of the state government, including all boards, bureaus and commissions which had been created by the General Assembly, with a view to provide a more perfect system of accounting and to combine and centralize duties. It was hoped that this study would lead to the rejection of much useless machinery and to a reorganization of the state government, with the aim of greater efficiency and economy in administration.

The committee was composed of some of the ablest members of the two houses. After organizing and outlining the undertaking in August, 1913, the committee employed as director, Dr. John A. Fairlie of the political science department of the University of Illinois. Under his leadership, the advice of a large number of officials and citizens was taken, after many hearings at which testimony was presented from almost every possible point of view. As a result of the committee's investigations, there was published a report of 1,050 pages, generally recognized as one of the most remarkable documents in the history of state government in this country.

Governor Deneen, and following him Governor Dunne, called attention to the proposition in their messages, but the gubernatorial campaign of 1916 was made the occasion for placing the code project before the people for general consideration and discussion. Colonel Frank O. Lowden made its championship one of the prominent planks in his platform. Immediately after the people had chosen him to the high position of Governor, he took active measures to make the idea a reality. In his inaugural address he emphasized the importance of the administrative reform. He secured the co-operation of many members of the legislature. He devoted long hours of study to the problem. Largely because of his earnest advocacy, the Civil Administrative Code became law.

Its salient feature, as has been stated, is the centralization of the various governmental agencies, with the exception of the Civil Service Commission and certain temporary boards, into the nine departments of Finance, Agriculture, Labor, Mines and Minerals, Public Works and Buildings, Public Welfare, Public Health, Trade and Commerce, and of Registration and Education. For each of these departments there is an executive officer, called a director, who must devote his entire time to the State work. He is provided with such subordinate assistants as are deemed necessary, the number varying in the different departments.

The Code has now been in operation for ten months. The experience has amply justified those who so strongly urged the administrative reform. Its machinery has worked far more smoothly than its most sanguine supporters had hoped. Naturally, some difficulties have presented themselves. The period of operation is as yet too short to warrant final judgment. Deficits from previous years had to be paid this year and imperative expenditures for long needed repairs and improvements had to be met. These have combined to handicap the financial authorities; but all who are actively associated in the administration confidently believe that, if given a chance for a fair trial, the Code will soon prove its value by substantial financial savings as well as by increased efficiency. The Department of Finance is the keystone to the structure. Its work is certain to show gratifying results. Its officers are giving the most painstaking scrutiny to

all outlays, and many kinds of waste heretofore ignored are being effectively checked.

Perhaps it ought to be said that the centralization of administration under the Code is not complete because, outside of its jurisdiction, there are certain so-called constitutional offices, such as those of the Secretary of State, the Auditor of Public Accounts, the State Treasurer, the Superintendent of Public Instruction and the Regents of the State University. Should the campaign for a new constitution, adapted to the needs of a great state such as Illinois has grown to be since 1870, be successful, one outcome of a constitutional convention might well be the inclusion of the duties of these officers under similar proper departments. In actual practice, however, there has been complete harmony between the constitutional officers and the Code ones, so that the entire governmental machinery at Springfield has been working smoothly in the direction of notable administrative achievement.

Limitations of time do not permit further consideration of the Code in its entirety. It is a remarkable state document. It represents a notable advance in political science. The plan of organization of each department is extremely interesting. The distribution of powers among the departments; the internal workings of the departments, and the great variety of the problems requiring administrative solution are alike attractive. The widespread interest awakened by the Code throughout the country and the report that several other States are giving serious consideration to the adoption of a similar plan of government, are suggestive of what is in store for the one who will study carefully the thirty-seven pages of this epoch-marking legislative act.

The special concern of this Society is in the administration of the Dental Practice Act of Illinois. In the reorganization scheme the licensure of dentists, formerly in charge of the State Board of Dental Examiners, was placed in the Department of Registration and Education. Something about this Department, therefore, may be of interest.

While the double name Registration and Education seems to imply dividend activity, a closer survey of the powers and duties of the department shows that the thought of education is

the dominant one. The word "registration" relates to the administrative work associated with all those professions and trades of whose members the state requires a license. The Department has jurisdiction over about a dozen different lines of endeavor, including those of the architects, barbers, chiropodists, dentists, embalmers, horseshoers, midwives, nurses, pharmacists, physicians, plumbers, structural engineers and veterinarians. It has a staff of twenty-seven persons whose work is being so organized as to distribute responsibility most effectively and to secure accuracy, efficiency and promptness in administration.

The oversight of the licensing features of the activities of the department is placed in the hands of an official called the Superintendent of Registration. He is charged with arranging for the necessary examinations as provided for in the statutes, with furnishing of adequate assistance for the examinations, with the notification of the successful candidates, with the keeping of the records and files of certification, and with the large amount of correspondence relating to licensure in the several lines. Inasmuch as all the laws which regulate licensure provide for the evaluation of credentials both of preliminary education and of professional training, the division of registration has among its duties the collection of the essential preliminary information about applicants and the investigation of their qualifications for examination.

So, naturally, the department must concern itself with the establishment of standards and the approval of both the schools themselves and their courses of instruction. If the authority given by the Code and by the several practice acts should be invoked to its full degree, it would be seen that the power of the department over schools of all grades and types is very great. The word "education" in the department's title, therefore, does not imply an entire change of thought from that of "registration." It may, however, be taken to refer to certain types of higher education which are carried on under state auspices, and which are professional, investigational, or strictly scientific in their nature. The five normal schools which heretofore have been controlled by separate Boards of Trustees, are now placed under the jurisdiction of the Department, with a single board of which the Director of Registration and Education is chairman.

Grouped under the department, also, are the four scientific surveys, located at Urbana, in connection with the State University, namely, the State Geological Survey, the State Water Survey, the State Natural History Survey, and the State Entomological Survey. For the study of the needs of these four surveys and the development of their work, a special advisory board of scientists, called "The Board of Natural Resources and Conservation" and representing the different fields of research touched by the surveys, has been provided, the director of the department being its chairman. The Department has jurisdiction also over the State Museum, located at Springfield. For advice regarding its management there is a Board composed of specialists representing the five different lines of activity with which the museum concerns itself, namely, botany, ethnology, zoology, manufacture, and museum administration.

The members of these advisory boards were nominated to the Governor by the Director with no consideration in mind whatever except to secure individuals of the highest character, entirely regardless of political affiliation, whose names would carry weight wherever mentioned. The normal school board, in like manner, is made up of selected men of exceptional fitness for their task. The department, in its administration, is greatly strengthened by its ability to command the assistance and advice of men of such pre-eminence. The magnitude of the educational work of the department, if expressed in terms of annual appropriations, is such as to make it fairly comparable with similar special departments in a great American university.

The controlling idea behind the Civil Administrative Code has been stated to be combination and co-ordination with localization of authority under responsible individuals. There is no doubt that the personnel of the directorate is a most important element in the successful working out of the plan. If the Code lent itself to the machinery of political organization, and the selection of officers were made purely for partisan reasons, special fitness for a given task being made entirely subordinate, there might reasonably be fear for the result. The scope of the activities of the several departments, however, is so broad as not only to require the full time service of individuals of recognized responsibility and position, but also to present to them for solu-

tion problems demanding the highest talent, and worthy of a strong man's best endeavor.

The Code specifically provides that the director of Registration and Education, the assistant director, and the superintendent of registration shall not be affiliated with any college or school of medicine, pharmacy, dentistry, nursing, optometry, embalming, barbering, veterinary medicine and surgery, architecture or structural engineering, either as a teacher, officer or stockholder nor shall they hold license or certificate to exercise or practice any of the professions, trades or occupations regulated.

The reason for this restriction is apparent. Absolute impartiality and exact justice are more likely to be secured where personal interest or possible professional jealousy are absent. In the working out of the Code plan there has been marked a notable change of attitude toward the law on the part of both chance and intentional violators. The prospect of being prosecuted by a great department of a State government, the executive officers of which are not members of the profession involved and whose main interest in the case is that of the enforcement of the law of the State, appears to be much more feared than was the danger of trouble with members of a board connected with the same profession. This has had many illustrations since last July. There is no doubt that every practice act of Illinois has become far more effective than it ever has been, because it now has behind it the machinery, the resources and the administrative power of a State department.

Another restriction of the Code provides that, whenever the several laws, regulating professions, trades and occupations which are devolved upon the department for administration so require, certain enumerated functions and duties shall be exercised. These relate to standards of admission, curricula of schools and colleges, rules and regulations of examinations, conduct of examinations, the granting and revoking of licenses. It is definitely declared that, where the law of a profession, trade or occupation so requires, none of these enumerated functions and duties shall be exercised by the department except upon the action and report in writing of persons designated from time to time by the director to take such action and to make such report.

This restriction is a safeguard against personal inefficiency,

arbitrariness, or venality on the part of the director, but it also is designed to indicate clearly the pervading idea of the Code, that the duties of former State Boards have passed under the administrative control of a department under the Code. The words, "designated from time to time" are important. There is no exact term of service for a member of an examining committee. The advantage of the limitation has already been shown in a number of cases, where trial revealed the fact that the individual selected was not well chosen. The objection to this plan is made, that there may be lack of continuity of policy where there is uncertainty of tenure. This is obviated by the possibility of reappointment of those whose worth has been demonstrated in actual experience. The danger in the personal appointment feature is the danger attending the entire Code plan. An individual honored with selection as director of a department, or, for that matter, given any important task to perform, either will, or will not, rise to his responsibilities.

A third safeguard declares that in making the designation of persons to act for the several professions, trades and occupations, the director shall give due consideration to recommendations by members of the respective professions, trades and occupations, and by organizations therein.

Working under these general limitations, the department has been successful in establishing friendly relationships with the best interests of practically every one of the professions and trades coming under its jurisdiction. The practice acts have been enforced strictly, the examinations have been above suspicion, the committee members have worked faithfully and promptly, and generous commendations have come from many influential citizens who have expressed their opinion that the laws in which they have been specially interested have been interpreted and carried out in a highly satisfactory manner.

The Code provides for the dentists a committee of five persons, each of whom has been a licensed practitioner of dentistry or dental surgery in the State of Illinois for a period of five years or more, and no one of whom is in any way connected with or interested in any dental college or dental department of any institution of learning.

Great care was taken in the selection of the first committee

to work under the new plan. Coming from an entirely different field of labor the director heard rumors of irregular proceedings in connection with dental practice in previous years. Anonymous communications received in the first days of incumbency of his office declared that certain dental supply houses boasted of their influence with examining committees and felt able to give assurances to intending candidates for licensure. Unfamiliarity with conditions in the dental profession and keen anxiety for a successful administration of the department placed in his charge combined to make the choice of the committee one of the most important acts of the opening months under the new Code.

The officials of the department were anxious to have a certain degree of continuity between the acts of the new department and those of the former State Board. With the records and the furniture of the Dental Board came the office clerk, under a Code provision, so that, in practical administration, much of the routine was handled exactly as before the consolidation. The assistance of the legislative committee of the State Dental Society was sought in connection with the choice of the advisory committee. Both through correspondence and personal interview every effort was made to secure harmonious cooperation. The committee, finally chosen, was selected from a list furnished by these gentlemen, except in the case of one member who was suggested and highly recommended by the superintendent of registration. In this endorsement the legislative committee heartily joined, so that, in every particular, the director respected that provision of the Code which states that "the head of the department shall give due consideration to the recommendation of members of the respective professions, trades and occupations and of the organizations therein."

The committee appointed was headed by Dr. Thomas A. Broadbent. His nation-wide prominence in the profession and his well known interest in forwarding the cause of dentistry in every possible way made his selection an honor to the department rather than to him. With him were associated Dr. H. J. Tharp of Chicago, Dr. James R. Welch of Peoria and Dr. E. F. Hazell of Springfield. Only four members were chosen for the year 1917, a fifth place being offered to several individuals recommended by the legislative committee, none of whom, however,

finding it possible to make the sacrifice demanded by disinterested service upon the examining committee. For 1918 Dr. F. B. Olwin of Robinson has consented to act as a member of the committee.

Some question has arisen regarding the form of license which has been issued by the department. Quite early in the process of study of the administrative problems presented to the officials for solution, it was found that the previously existing Board had made it a practice to collect a renewal fee of one dollar from each successful applicant for examination, at the time of payment for his license. The questionable propriety of requiring a renewal fee from a newly created dentist for a license not yet delivered to him was considered. It was seen that the dental practice act appears to call for two certificates. One is a license, which, however, seems to be valueless anywhere, whether at home or abroad, after November 1st of the odd-numbered year following the date of its issue, unless it is accompanied by a certificate of registration, which certificate is stated to be *prima facie* evidence of the right of the holder to practice dentistry, or, to use a common phrase, shows that he is "in good standing."

The previous Board apparently sought to remedy this defect by requiring the renewal fee right from the start of the professional career of the successful candidate for licensure. The department attempted to solve the problem in another manner, namely by the issuance of a single certificate which would answer the double purpose of license and of *prima facie* evidence that the license was good. It first sought an opinion from the Attorney General, whether the proposed certificate would meet the provisions of the law. This opinion being given in writing and declaring that the single certificate would suffice, the department proceeded accordingly. It had no interest whatever in the subject except as it was desirous of administering the dental practice act in the best possible manner. Its officials were surprised to learn of the criticisms directed both against the plan and the form of the certificate itself.

Some wanted a license *per se*, although, under the terms of the Illinois law, such license is valueless unless accompanied by certificate of registration, so far as this State is concerned;

and is valueless anywhere else, since no other state will issue a license to a dentist from Illinois, unless he is "in good standing" at home. Some objected to the form of the certificate, declaring it exactly like that issued to the horseshoer, the embalmer, or the chiropodist. They might have added, also the physician, the pharmacist, and the registered nurse. For Illinois, slowly indeed, has taken up the idea of uniformity of certificates, long popular in other commonwealths, and strictly in harmony with the idea of the Civil Administrative Code. Some lamented the passing of the ornamental border with which former certificates were embellished. Some complained bitterly that a new frame was required, because the new certificate would not fit the old one. Some even went so far as to get another opinion from the Attorney General, contradicting the one rendered to the department.

As the department's prime interest and responsibility are in the enforcement of the law, to the end that the dental profession in Illinois may be safeguarded and advanced, it is entirely willing to be guided by the wishes of the dentists of the State in the matter of the form of certificates to be issued. It will find pleasure in preparing and distributing any varieties of licenses and certificates upon which the representatives of the profession may agree, waiving all claims to discretion as to size, wording, style of border, or color of ink to be used. What it has done has been with earnest purpose, and, supposedly, in entire harmony with the provisions of the law.

Question also has been raised regarding the strict enforcement of the practice act in the matter of fine for violation of the law, in addition to the restoration fee, in a case where a license has lapsed because of failure to pay the registration fee for renewal. The law requires a restoration fee of twenty dollars, and also provides a fine of from fifty to two hundred dollars for illegal practice. In its determination to enforce all the laws placed in its charge, the department had its inspectors make inquiries regarding dentists. Many violators were discovered, some of whom had been enjoying the benefits of practice in this State for long years without paying the fees, provided for by law and paid properly and promptly by the great majority of the profession. When they were arrested, as the law contemplates that they

should be, influence of all sorts, political and professional, was brought to bear upon the department in their behalf. The officials of the department were charged with persecution, and even some of the individuals to whom they had a right to look for hearty support in the enforcement of the law joined in the pleas for abatement of the penalties. Incidentally it was discovered that there are quite a number of practitioners who claim never to have known of the registration feature of the law, even though in one instance the individual had been prominent in the official circles of a county dental society and had attended several meetings of the State Dental Society, where the provision was discussed and favored.

But here again the department of registration and education has no desire to legislate or to express an opinion upon a professional question. Its duty is to enforce the law. Its officers are under oath to perform their duties under the law. The law is plain. If the double penalty of restoration fee of twenty dollars and fine of from fifty to two hundred dollars is too severe, steps should be taken to have the law amended. But, until that is done, the law should be enforced strictly and at least the minimum fine imposed.

The value of the renewal fee is increasingly apparent. It enables the department to keep in touch with legal practitioners. It is a great aid in keeping a correct roster of addresses. It affords opportunity to discover cases of individuals using the licenses of others who have died or have left the state or from whom certificates may have been stolen. It enables the department better to control some of those unethical practitioners whose actions bring discredit upon the profession. It furnishes funds for the department at slight cost to the individual dentist. Its willing payment provides a splendid argument against the imposition of a larger annual state license fee, easily possible in these days of regulation, when governments are seeking everywhere for increased opportunities for raising needed funds. It is strictly in line with the best practice elsewhere. Even some of the professions which have not availed themselves of its advantages are now planning its adoption.

The work which the Department has done in connection

with the dental practice act, since its organization on July 1, 1917, is indicated as follows:

Examinations for dentistry are held in June and November of each year. Under the administration of the Department, therefore, only the November examination is to be reported. Fifty-four candidates presented themselves, of whom forty-seven were successful and seven failed. According to the records, there are now 5,015 legal practitioners of dentistry registered with the Department.

In May last, before the Department began its work, two new reciprocity agreements were made, namely, with Kentucky and Minnesota; so that at the present time Illinois has reciprocal agreements with the following states: Alabama, Arkansas, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Missouri, Minnesota, Nebraska, Ohio, Vermont and Wisconsin.

From July 1, 1917, to May 1, 1918, the Department has filed in the courts thirty-two cases against dentists. Of these, twenty have been settled and twelve are still pending. In six instances, licenses which had lapsed were restored upon payment of the \$20.00 fee provided for in the law. In fourteen cases fines were assessed aggregating \$570.00.

The Department of Registration and Education desires the strong support of the best elements of the dental profession in the State, represented in this great State Society. Its ambition is to help in every possible way toward the upbuilding of the profession. Its aim is to enforce the law regarding dentistry as strictly as it may. It looks forward in the near future to the completion of lists of approved schools of various grades from the public school, through the colleges and the professional schools. It will have for the aid of the dental profession the benefits of inquiries now being made in connection with other professions whose laws it likewise is called upon to administer. The worth of this larger fund of knowledge illustrates the value of the department under the Administrative Code as compared with previously existing boards, whose work was limited to a smaller field.

In connection with every profession and trade nowadays there is a demand for greater efficiency and consequently for better preparation. This demand is a reflection of the national

spirit as it has been stimulated by the lessons of the great war. Many an applicant for position in army or navy has been sent back home, branded unfit. The calls for men skilled in particular crafts have been unanswered, because of the lack of such workers. Our equipments have been defective, our curricula inadequate, our instructors poorly prepared and uninspiring, our student methods slipshod and lazy. In the hour of national peril and world testing, our people have been weighed in the balances and found wanting. When the war is over, Americans may swing back into their paths of ease in some respects, but they are not likely to tolerate for the future the ineffective machinery for education, whose faults have been made so apparent in recent months.

So those who are working toward better standards for professional preparation in Illinois have determined to share in this national movement for increased efficiency. They aim to make more rigid requirements for licensure, so as to eliminate the unfit; to demand more careful attention of college officials to the records of student work; to scrutinize with greater pains credentials of preliminary preparation. Thus they hope better to protect the individual who spends his money for training, and, more important yet, to protect the people against the impositions of unworthy and untrained practitioners. These ambitions attained, it goes without saying that the dental profession in Illinois will be placed upon a higher plane of honor than ever.

As Director of the Department of Registration and Education, I can assure this Society with confidence, that the department will not be satisfied until the requirements for dentistry here are as high as in any other part of the country, and indeed until all learn to turn to Illinois to find the leaders in all movements looking toward the advancement of this honorable profession.

GO TO THE BOOKS.*

BY HARRY F. LOTZ, D.D.S., JOLIET.

Students of dentistry, who were in Philadelphia prior to the year 1895, will recognize in the title of my paper a favorite saying of a teacher of dentistry, who did much to mold the lives of those who came within the circle of his influence.

Dr. James E. Garretson, whom I have quoted, was fond of insisting that every student should own at least five books—Gray's Anatomy, U. S. Dispensatory, Brown's Grammar of English Grammars, Burton's Anatomy of Melancholia, a medical dictionary—and with Garretson's system of Oral Survey, a student was equipped to go on with his dental studies.

If you do not *know*, "Go to the Books," is as true today as it was in Doctor Garretson's time, and the continually going to the books day after day by a student with a receptive, retentive mind will recompense the individual for the time and work spent in following this advice of the Father of Oral Surgery.

A member of the Will-Grundy County Dental Society received his commission on Friday, with instructions to report the following Monday at Camp Pike, Little Rock, Ark. The writer had the pleasure of being with this fellow worker when he turned the key in his office door, perhaps for the last time, and I wish you all to know that the only things he carried out of his office were his dental books, saying, "I will need them in camp." Do you think our soldier boys are safe in the hands of this Lieutenant? I do.

One of the most wonderful things about this war is the fact that it is stirring people to think, and to think hard, about all sorts of questions. Such mental exercise has not been indulged in by the human race in generations.

Beyond the shadow of a doubt the men who do big things differ from those who don't chiefly in the activity of their minds. The big doers keep up a continual mental struggle, collecting and absorbing new facts, studying to understand them, trying to put two and two together—until out of this activity they hit upon good practical ideas which they see clearly. No mentally lazy man ever had

* Read before the Illinois State Dental Society, May, 1918.

a really good idea. Good ideas are born in brains that keep working.

Editorially the *Cosmos* of May, 1918, page 444, says:

"The world is being remade. New social conditions are being created, and when the period of reconstruction and reorganization succeeds the present agony of conflict and slaughter the signs of the times all point to the establishment of new ideals of altruism as the dominant feature of the world's social organization. Good judgment and wisdom dictate that dentistry should now begin to shape its activities so that they shall be in harmony with the new order."

A million young men called from their present occupations are an army of students, for in every branch of the service, intense instruction and study is required of our soldiers. Echoes from the National Educational Association meeting at Atlantic City this spring tell us that there are 700,000 men in the draft unable to read or write. Instruction is being provided for these men, earnest study is being carried on by thousands of men in our army camps; students are being made in great numbers; our young men will be coming back imbued with the desire for book learning.

General Pershing asks for fifty tons of books—all kinds of books—from tales of adventure to encyclopaedias. There has been great demand for industrial text-books as well as standard fiction, and the Library War Service of the American Library Association which is furnishing books to men in military service, both in this country and abroad, has many requests constantly for books.

The men want the books for recreation and study and the association has found that they are eager to read, and in every camp from eight to twenty branch libraries are maintained in Y. M. C. A., K. of C. and Y. W. C. A. buildings, and in hospital reading rooms.

Magazines by the hundreds of thousands are being sent to our boys, and are being read by them. All kinds of magazines full of the latest research and the knowledge of focal infection, etc. Soldiers are grasping the ideas. If you do not think so read the "symposium" in the *Items of Interest* for April, 1918, page 309, where a soldier voices the protest which we as dentists must heed, and it behooves us to "Go to the Books," so that we will be better able to answer the many questions which will be asked of us in the near future, when the boys come home.

During this generation the habit of business reading has spread among Americans.

As a boy, in Pittsburgh, Andy Carnegie was given the run of a rich man's technical library, and so enabled to lay in the knowledge that he utilized so well in later years.

Today every business of any magnitude has a library of well chosen books.

An article in the Publishers' Weekly states that J. P. Morgan & Company has a library of 6,000 business books—the National City Bank 20,000 volumes and 400,000 indexed pamphlets of Commercial lore—the Metropolitan Life Insurance Company 19,000 such books.

I am glad to say that in recent years there have been established complete and comprehensive dental libraries in all large cities in this country and many notable private collections of dental books.

Have you heard about Smith's busy day, "Yesterday," said Smith as we sat at luncheon. "The man who is said to be the greatest salesman of life insurance in the world, H. B. Rosen, told me all his selling secrets; the same afternoon Elmer R. Murphey gossiped with me about his trip to Japan and told me what goods can be exported there." Smith toyed with his celery a moment and then continued, "Just before that, Professor Heilman had analyzed for me the matter of maintaining profits in 1918."

"Then there are the remarkable cases of the president of the National Biscuit Company and the president of the Mutual Film Corporation; each man got where he is in a totally different way, as they described to me yesterday. A coal expert gave me some splendid ways we can save our fuel; a girl librarian showed me how technical books make money in an office. Meanwhile I had a couple of hundred or so different commodities and devices explained." "Stop! Stop!" I cried, "You might do all that in a month, but not in a day. What do you mean?"

"I read System," answered Smith.

It is equally true of dentists who read their magazines each month.

Knoche talks to us of Crown and Bridge work; Colonel Logan of war work and Price on Research (in the *Journal of the National Dental Association*). From the *Cosmos*, speaks Cryer on Anatomy, the late Callahan on Sulphuric Acid Treatment, Kirk, editorially; from the *Items of Interest*, Angle on Orthodontia; Ottolengui. "Around the Table," Lourie & Case; DENTAL REVIEW, Johnson,

Black, Buckley and Coolidge; The *Dental Digest*, Clapp, Williams, Hollister and Kells, all bring us knowledge which we may use in our calling.

There appeared in the *Dental Cosmos* for February, 1918, page 128, an article on Dental Bibliography; "The Need of An Index of Periodical Literature," by L. Pierce Anthony, in which the writer calls attention to what has been done in the past and then proceeded to show why such records of our Literature are more necessary and important today than ever in the history of our profession.

The literature of a profession is the permanent historical record of its progress and advancement, and every member of this profession should be sufficiently interested in his own advancement and progress to keep abreast of the progress made by his professional brethren.

There is only one way in which the dentist can keep in touch with the advancement of his profession, and that is by constant reading of the periodical literature in which is recorded from month to month the latest improvements and suggestions in the various methods of dental procedure. As a previous writer on this subject aptly expressed it, "The periodical literature of dentistry is a serial story and ever unfolding record of dental achievement. Each installment, whether it be a copy of a journal, a book, a pamphlet, or a report, adds its incidents to the main trend of the story."

The dental profession has long borne the stigma of being a non-reading profession. Before writing this paper I outlined the making of a survey in one of the large office buildings in Chicago which is given over to the housing of many dentists. I was so depressed with the advice given me by my friends that I did not have the heart to go through with it—such remarks as these: "Floor space is too valuable to have a desk, books and journals." "Why, hardly a dentist would see you between the hours of 9 and 5, let alone take time to tell you how many journals he subscribes for, reads, etc." Thank goodness, that membership in the Illinois State Dental Society brings two journals at least, to every member today, and two good journals—the *Journal of the National Dental Association* and the DENTAL REVIEW, but a survey should be made and if dentists are subscribing and reading dental journals, let us stamp out that stigma that dentists are a non-reading profession.

The claim has been made with some justification that the reason why dentists do not read more is that they are too busy in their practice and are too tired and mentally exhausted when their day's work is done to devote any considerable amount of time and energy to study, but in this respect we have the peculiarly anomalous condition that the busier the dentist, the more important and necessary it is that he should study and read for his own benefit in the way of learning improved and possibly shorter methods, as well as for the benefit of the community that he serves. The writer goes on to say that the time has arrived for a definite and permanent effort to be made to publish a monthly index of dental literature that will serve as an intelligent directorate guide to the busy dental practitioner with limited time available for study.

Recognizing the need for such an index, the National Institute of Dental Teachers some years ago promoted the establishment of the Dental Index Bureau to devise ways and means of publishing a monthly index of periodical literature. The Bureau proposed to publish a monthly index of, say, six journals on the Dewey decimal system of index classification as adapted to dentistry by Dr. Arthur D. Black, but thus far there have been no material developments from the project.

The Dewey index system is undoubtedly the most comprehensive system of indexing in existence today. I wish to digress here long enough to say that I agree with the author, and that as years go by the one thing which will live the longest and stand out distinctively as a remembrance of the Golden Jubilee meeting (50th annual meeting) is the historical booklet, printed in the Transactions of the Illinois State Dental Society, 1914, with classified index of all papers, discussions and clinics, and personal index of administration, papers, discussions and clinics as published in the Transactions of the Society, 1865 to 1914, which carries an appendix, "The Dewey Decimal classification and index applied to Dental Literature, by Dr. Arthur D. Black."

Dr. Black says in this article, "This is the first publication of a classified index of dental literature on the Dewey system, and it is hoped that it marks the beginning of a new period in the attitude of the members of the dental profession toward our literature."

Further, Dr. Black says: "It is also hoped that the publication of this index by the Illinois State Dental Society will be of material

aid in establishing it as the standard plan of the future in the indexing of dental literature."

We wish to here record again the saying of Dr. G. V. Black, "Good Literature, made easily accessible, serves to strengthen the mind and hand of every progressive practitioner."

The writer wishes to suggest this one step in advance in promoting the use of the Dewey index as applied to Dental Literature. If the journals, say the DENTAL REVIEW or the *Journal of the National Dental Association* would print the index numbers of the Dewey classification opposite the titles of the papers as they appear in the journals, for illustration an article printed in the journal under the heading of Abscess, Alveolar, using index in the way we have in mind—D65 would appear on the same line as the heading of the article, which means that D being substituted for the number 617.6, which is the number for Dentistry in the Dewey classification, as brought forward by Dr. Black, and 65 being the classification number given Abscess, Alveolar. The magazine reader wishing to card index all material on Abscesses or any other subject, could take a few minutes and make out his own filing card. Cards could be standardized for this work, also filing cabinets. It is true in many instances that even students classify only that material which they think they will have use for in the future. The writer thinks this would be an incentive for every dentist to go through his journals each month, have some idea of what they contain, pick out and classify with very little work these articles which he wishes to refer to in the future.

There is no system, scheme, helps, aids, etc., that will be so simple that it will not take some effort on the part of the one who wishes to keep in touch with the literature of his profession, but it is the busy dentist, not the dentist who thinks he is busy, but the man whose time is filled with many things in and outside of his profession, that this suggestion, if carried out by our magazines, would benefit.

It has been said that an hour a month devoted to the classifying of several magazines using the system brought forward by Dr. Arthur D. Black will give a complete index of the journals covered, so the asking of our publishers to adopt this aid in classifying the articles will not incur much labor or expense and will be a great help to those who save their magazines for future reference.

After twenty years, the DENTAL REVIEW in 1906, appeared in a new cover. On page 79 the editor has this to say about the new cover:

"In designing a new cover for the DENTAL REVIEW the idea was suggested by Mr. Wilde, of the publishing department, to have printed the names of men most prominent in the development of dentistry, together with their portraits as far as this was practicable. It was thought that in doing this the profession of the present day would have constantly before them a reminder of the pioneers in such a way that due appreciation of their services might not be overlooked. In the rush of modern ideas, and the absorption in present activities we are sometimes prone to forget what has been done for us by those who have gone before, and no effort should be spared to keep alive the memory of the men who wrought so faithfully for dentistry when the profession was sorely in need of their services."

"In arranging such a list the chief difficulty was to select the proper names. This problem was solved by appointing two men to make the selection for us, men who have long been identified with dental biography and who have given much study to the history of the development of the profession. These two men are Dr. Charles McManus of Hartford, Conn., and Dr. William H. Trueman of Philadelphia, and their cordial co-operation in this matter places the DENTAL REVIEW under great obligation to them. We feel sure that their efforts in this direction will also be fully appreciated by the profession. A most gratifying feature of their work relates to the fact that in making out a list independently of each other, the two lists were found to agree so very closely that almost no rearrangement was necessary. To enumerate their reasons for the selection of the various names would require too much space, but that they were all valid no one who is familiar with the men can doubt. We are doubly indebted to Dr. McManus for furnishing us with the portraits, which we believe are the best in existence of the different men, some of whom have passed away so many years that their portraits are really a treasure to the profession. We can only hope that our readers may be pleased with this new feature which marks the inauguration of our 20th volume."

1906 MARCH, PAGE 315, THE DENTAL REVIEW.

"The new cover of the DENTAL REVIEW has received the cordial commendation of our readers, and also of the dental press. The

kindly notices given are greatly appreciated, particularly that of our esteemed contemporary, the *American Dental Journal*, which in its February issue, pays us a graceful compliment."

With the 1918 January issue, we miss the kindly faces, which were a constant reminder for us to "Go to the Books." One incentive is gone, which stimulated the recipient to study the past of his chosen profession: The old plates were so worn down and impossible to replace that a new more modern cover became necessary.

Cosmos, 1906, January, page 107.

It has been said that, "A fair knowledge of what that profession has accomplished, by whom it was accomplished, and when, is a kind and amount of knowledge which no member of that profession has any moral right to be ignorant of."

It costs something in time and money to acquire the knowledge which is here referred to. It is not to be found in any one book, but is acquired only by systematic and intelligent reading of all the literature of dentistry, by careful notation of the important features, historical and technical, and by comparison and digestion of these principal data. It is a kind of knowledge not to be obtained in colleges, but as the result of a continuous lifelong habit of systematic study.

The mind grows old very slowly and can be educated even late in life.

We wish to call your attention to the notice of the "Dental Library Association," which appeared in recent issues our journals. Will insert it here, believing that there are many who have not come in contact with the announcement, which reads:

"Believing that one of the most important functions of a dental library is the interchange and the exchange of dental books and journals, it has been thought advisable by a great many dental librarians to form a dental library association, similar to the medical library association."

"Object: The fostering of dental libraries and the maintenance of a system for exchange of dental literature and duplicates. Securing and distributing the Transactions of dental societies."

"Membership: Any Dental society, association, university, college or library having a fixed home, and a dental library."

"Any individual interested in Dental Literature or Libraries."

"BENEFITS: The banding together of a united body with a common cause. The betterment of conditions in dental libraries. A clearing house through which books, journals, reprints or lists of these, may be sent from one library to another."

"We desire to know what libraries now exist and how many would be interested in the formation of such a society. Signed, B. W. Weinberger, Librarian, First District Dental Society, 40 East Forty-first Street, New York City." We hope many have made application for membership, including our society librarian, for it seems to be an advance step.

There is so much moving about these days that people are in a constant state of physical unrest; that induces mental unrest which is unfavorable to real work of any kind. The possession of an auto obligates one to make use of it, to keep one's family and friends out of doors, and riding in the fresh air is conducive to sound sleep, not study. Club life in the cities takes much time, which might be devoted to study, and war work is so fascinating to everyone, that one counts that day incomplete when one or more hours in the evening are not given over to helping with some phase of the work, or to listening to a patriotic address, or to the experiences of those who have been in service. Therefore time must be taken during business hours to keep in touch with the journal literature of one's profession. If the hours are full, fees should be increased until certain hours can be devoted to study. Every dentist who runs his office, rather than have his office run him, sets aside time for laboratory work, and time for other things, why not hours for study. Everyone recalls that Dr. G. V. Black set aside the first hour of each day, for years, to study. Everyone will say that his time was well invested.

"Go to the Books." And in so doing, listen to the advice of the young Solomon, when he sang of wisdom:

"Happy is the man that findeth wisdom,

"And the man that getteth understanding,

"For the merchandise of it is better than the merchandise of silver,

"And the gain thereof than fine gold.

"She is more precious than rubies;

"And all the things thou canst desire are not to be compared unto her.

"Length of days is in her right hand ;
 "And in her left hand riches and honor.
 "Her ways are ways of pleasantness,
 "And all her paths are peace.
 "She is a tree of life to them that lay hold upon her ;
 "And happy is everyone that retaineth her."

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 MAKING YOUR MONEY EARN MONEY—SAFELY.

Article VII.—Consistent Savings and Investment.

BY GEORGE LEE M'CANDLESS, CHICAGO, ILL.

The proposition of putting something by for a rainy day probably receives consideration from everyone. The chief obstacle usually consists in the method to insure its working out.

When a man says to himself, "I will place so much in the bank each week or month," the chances are he may start it but will never stay with it. There is not enough compelling incentive for such a plan in these days when so many uses can so easily be found for all the money one can get.

Also money set aside in this manner does not accumulate as rapidly as could possibly be desired. Because of this many promoters offer opportunity for the purchase by installment payments

of their "Sound stocks which will net large profits." When you get an opportunity to buy "big dividend payers" this way you can put them down as a poor buy. You probably will often get such opportunity for, don't forget, there are as many dentists' names on every promoter's "sucker list" as there are in the telephone directory.

There are some stocks quoted at a few dollars or cents per share, and this usually induces the small investor to buy them. The purchase of these things is only gambling and the man who gambles with his savings is playing for a fall.

Savings and Loan Associations help supply the compelling incentive to consistent savings by requiring members to pay so much periodically. However, when such associations promise higher interest return than a savings bank it is necessary for them to reinvest your funds in things which pay still higher rates than savings banks are allowed to buy, and the safety line is often passed. Until laws regulate investments of such associations they will continue to fail now and then as they have done in the past. The best present day method of installment investing is the purchase of Liberty Bonds and War Savings Stamps and a subscription of more than you feel you can ever pay for is recommended as a savings stimulant.

An investment account with a good bond house whereby you are continually in debt for the purchase of sound securities is also suggested. Such purchasing can be arranged for while still following rules for investing recommended in foregoing articles.

A dentist, uncle of the writer, recently sent me a few thousand dollars to invest for him. By adhering to these rules for investing several bonds were carefully selected for the investment of this money. Several high-yield securities at present available were included. When one of these bonds sold up to a point showing a profit, it was sold and a reinvestment made in another equally attractive bond. In the same way other bonds in this account have been traded for others in the same manner. In this way small profits have been realized in addition to an attractive interest return and a strong liquid investment position which the writer religiously intends to maintain. This is mentioned as a matter of special interest because it shows the method of making your money earn the most money possible with safety and because this investor is a dentist.

PROCEEDINGS OF SOCIETIES.

THE ILLINOIS STATE DENTAL SOCIETY.

FIFTY-FOURTH ANNUAL MEETING, HELD AT BLOOMINGTON,
MAY 14-17, 1918.

DISCUSSION OF PROF. SHEPARDSON'S ADDRESS.

DR. ARTHUR D. BLACK (Chicago):

Mr. President, Professor Shepardson and Members of the Society: I am sure it has been a delight and inspiration to all of us to have this presentation of the work of the State Department of Education. It is, however, not different from what we had the right to expect, because, as most of you already know, Professor Shepardson is a man who has devoted his life to educational work, and has been for more than twenty years connected with the University of Chicago as a teacher and in the Administrative Department, so he was especially well qualified to do the work assigned to him by Governor Lowden.

I think the time is not far distant when our country as a whole will recognize the wonderful thing that happened in the State of Illinois with the adoption of this administrative code law. We ourselves do not yet appreciate it as we should and we will not until sufficient time has elapsed for us to learn what has really been going on since the law became effective. It has been a pleasure to all of us to have this very clear-cut description of the aims and objects of this law, also to know what has been accomplished directly for the dental profession. When we come to appreciate the fact that this one department, of which Professor Shepardson is the head, has charge of fourteen sub departments of our State Government, and that the same thing has been going on in the other thirteen as in ours; and when we also consider that there are eight other of these main departments, each one of which has been working along somewhat similar lines, we may begin to realize the wonderful change that has taken place in the administration of the affairs of the State of Illinois. The most important thing about this new law is the fact that it has to a large extent taken the administrative affairs of this State out of politics. When Governor Lowden selected the nine

men to head these different departments, he picked out the other eight for the same reason that he selected Professor Shepardson, because he thought him the best man for the place. A man like Professor Shepardson, or any of the other eight who are the heads of these departments, is not likely to take chances on the failure of his department by appointing a lot of politicians as subordinates. The men at the heads of these departments know their reputations are at stake and they are not going to take a chance of losing their reputations by filling their departments with subordinates just for political reasons. I believe we have in this Code Law a law which will place Illinois far ahead of every other State in this country in its administration, and before many years state after state will enact similar laws until this will become practically the law of the land in state administration.

We are naturally more interested in this presentation as it applies to our field of endeavor. I think we must realize the value of central organization in the control of the educational affairs of the State. One of the greatest difficulties that Dental Colleges have had all over the country in coming to a determination of their preliminary educational requirements has been the fact that there has not been uniform control of preliminary education. New York State is one of the few that has controlled its education from the ground up; from the grammar school through high school and professional schools, New York absolutely controls. The same control is possible in the State of Illinois under this new law; how splendid it will be when the time comes that we may have a uniform high school course throughout the State, so that when any one of our sons goes to a high school, no matter in what section of the State, we know when he graduates he is prepared to go to any institution that admits high school graduates.

Professor Shepardson hinted at the classification and direction of professional schools. It has been a pleasure for those who have been connected in professional school work, both dental and medical, to know something of the plans of the Department of Registration. I happen to know of certain medical schools which have been practically put out of business quite recently, because they were not complying with the law. Fortunately we have in this State no dental schools of which we have reason to be ashamed; we have none which are not practically fully complying with the law. But we have

throughout this country many dental schools which are not educating men as the law of Illinois, for example, requires that they be educated, and yet graduates of these schools may come into Illinois to practice.

Closely related to this problem is the action now being taken by those in charge of medical and dental educational affairs in the Surgeon General's office in Washington, and it looks now as though one of the good things which we will get out of this war will be a cleaning up in medicine and dentistry of all the poor educational institutions; because the Surgeon General's office has under the law been required to classify all medical and dental schools. The Surgeon General is required to classify them because the law provides that students in reputable dental or medical schools are entitled to enlist in these Enlisted Reserve Corps, and the Surgeon General's office must decide which schools are reputable; therefore we will have for the first time a definite classification of the dental schools in this country.

As was stated by Professor Shepardson, he has taken occasion to frequently consult members of the legislative committee of this society relative to appointments and on many other matters relative to the activities of his department. It has been a pleasure for the members of this committee to confer with him and to call a number of matters to his attention in the interest of better dental service. I can only emphasize what he has already said relative to his attitude toward the dental profession in this State. We have been clamoring for years for the enforcement of the law for the prosecution and elimination of those men who are practicing illegally. We have come to the time in this country, as a result of the war primarily, when all of us are expected as never before to live up to the letter of the law. Possibly for the first time since we have had a dental law in this State, we have conditions such that the law may be enforced. We have at the head of the great Educational Department a man who says he will enforce that law to the letter if this society will stand behind him. Are we going to stand behind him if he does that?

The question came up to this Legislative Committee in connection with one member of this society who was being prosecuted because he had not renewed his license, and I want to confess here before Professor Shepardson and all present, that at first I criticised

the department for prosecuting that member because he was serving on one of the advisory boards for the Government and apparently, as the presentation came to us, was serving his country well in that capacity, and that he was being prosecuted because through some oversight he had neglected to renew his license to practice. When all the facts came out it was learned that he had not renewed his license since the law went into effect in 1907.

Mr. Shepardson asked whether the society wanted him to withhold prosecution. I said that this society had fathered every dental law that had been passed, and we had no intention of going back on any law in force now. (Applause.)

I am sure we have all been delighted with this splendid presentation by Mr. Shepardson, and I am sure we all have confidence that Professor Shepardson has undertaken the work of this department for the sole purpose of bringing the dentistry that is practiced in this State up to the highest standard, and I feel it is up to us, not only here in this meeting, but in our respective communities all over the State, to give this department and its work the very fullest possible support.

DR. T. A. BROADBENT (Chicago):

I was very much pleased with this admirable address. I am sure we are all delighted with the manner in which Professor Shepardson has presented this subject. I think it has made clear many things that probably were not clear in the minds of many of the members. I wish to say that my association with this department these last few months has been satisfactory. It is indeed a great improvement, to my mind, over the old method of conducting administrative affairs of the Dental Board. No one cared to be secretary of the old dental board, for the reason that, while he should have been allowed sufficient salary to give his entire time, that was not possible under the appropriation. With the boards consolidated in this new department and the affairs of the administration being conducted in such a very satisfactory manner I am sure the profession is to be congratulated. I want to thank Professor Shepardson for the flattering reference which he made to us in his address, not that I consider it was justified, but I appreciate it just the same. I also wish to assure Professor Shepardson and the society that while I remain on this committee I shall give it my best attention and endeavor to do my part to make the administrative Code Law

a success, which it undoubtedly will be, as it is no doubt a great change in the right direction in the administration of the affairs of the State.

DR. C. N. JOHNSON (Chicago):

I did not intend to take part in this discussion, but I feel it is a duty and a very great pleasure to say that is the most able document that has ever been presented to this society upon that subject. (Applause.) I want to pay tribute to Professor Shepardson by saying that fewer mistakes have entered into this new movement than I have ever known to enter into any reform. There was possibility of mistake by these gentlemen who were taking up a new line of work, but I have been so impressed with the lucid statement given us today by Professor Shepardson that I feel the affairs of administration, not only of our profession but others in this State were never in such encouraging condition as they are today. I want to express my appreciation to Professor Shepardson for the interest he has taken in our profession. Listening to this document we must leave here with the conviction that he has possibly given us more attention than any other profession. I do not say that is true, but that is my impression, because he has shown a keener conception of the real needs, not only of our profession but of the people of the State, than any other man I have ever heard outside of the dental profession. In former days the prosecution of a man for illegal practice was a difficult matter, but from this time on these prosecutions being directed from this department will have a greater weight than before, and we as professional men, will be free from any criticism of unjust action against any member of our profession. Affairs of this State, so far as the dental practice acts are concerned, are more promising than I have ever seen. I want to express to Professor Shepardson the sincere thanks of this Society for the interest he has taken in this work. The administration of the educational affairs in this State will be on a higher basis than ever in the past.

DR. H. W. McMILLAN (Roseville):

We have certainly had an excellent report from Professor Shepardson, but I want to speak of an evident discrepancy in connection with my report of this morning. I knew this morning that there were registered at the present time in the State Department of Registration and Education five thousand and fifteen dentists, al-

though the totals from the seven district superintendents could account for only about 3,700 of these. According to the published report that we had there were 4,871 registered dentists, and 772 of these were non-resident dentists, leaving 4,099 resident dentists. Since the last published report there has evidently been 144 new names added, now amounting to 5,015 registered dentists. Taking the 772 non-resident dentists away from 4,871 registered, this left a total of 4,099 resident dentists. There is an apparent deficiency between the 4,099 and the 3,700 I reported this morning. The figures show that we have about 400 resident dentists unaccounted for in addition to the increase since the last published report. I suspect this discrepancy is due to the situation in cities where there are dental parlors or shops where one does not know how many dentists are employed, and where they are conducted as a commercial business and not as a profession. It occurred to me that I might bring this matter up. The State of New York has passed a law requiring each dentist to conduct his profession under his own individual name only, and not as an impersonal commercial business. People go to a dentist for his individual work, and he must therefore conduct his business individually and not collectively. He must not run a shop such as Magic Painless Dental Parlors, in the State of New York. That law has been sustained by the Supreme Court of the State of New York and in that State, where each dentist must conduct his individual practice, you can count your dentists. In this State there are probably 500 that one cannot easily trace. Of course they may not practice illegally, but at the same time our law is more lax than that of the State of New York. I thought I would mention the probable reason for the discrepancy between my figures given this morning and those just given by Professor Shepardson.

DR. H. J. GRAHAM (Chicago):

There ought to be an appeal made to the dentists to report those whom they know are practicing illegally.

DR. J. G. REID (Chicago):

I want to express my appreciation of this report. I was for a number of years a member of the State Board of Dental Examiners, in fact longer than any other one member continuously. The reform that seems to be taking place at this time is a remarkable one, and a very distinct progress over anything that has heretofore been shown. We cannot fail to appreciate that independence and free-

dom from the influence of politics that appear in this report. Being appointed as they are with no political affiliations, the officers of the Department of Registration and Education are in position to act with absolute independence. I simply arise to express a feeling of great pleasure at hearing the report.

HONORABLE FRANCIS W. SHEPARDSON :

I certainly appreciate the statements which have been made here. The only way we can find out about offenders is to have them reported to us. I hope at noon to get hold of Dr. McMillan and find out the names of all those who are ineligible, who are not worthy to become members of this State Dental Society. By following that line we can find the individuals with whom we should work. One other thing might be interesting and that is to know that the Governor gave complete freedom in regard to appointments. I could not tell you to save my life the political affiliation of a single person on the dental committee. (Applause.) I nominated many committeemen to the Governor, but in not a single case did I inquire whether a man was a Democrat or a Republican (applause), because I saw that there was absolutely nothing to this Code government plan unless efficiency and economy, rather than party allegiance, were the two key words which should be emphasized always. Gentlemen, if the Department can have your hearty cooperation, if we can have your cordial support, when we do get hold of a man, even if perchance he be a member of this organization, it will help us to let the law take its course. I believe the people will have a much more wholesome respect for the dental practice than they could have if all kinds of influence were brought to bear upon the individual committeeman. And, remember, the salient feature of the Code declares that no one connected with any business or profession whose members are licensed by Department can be an official of the Department, so that it is absolutely free from that personal influence which sometimes leads members of a profession to be a little lenient with their fellow practitioners when their hearts prompt them to be severe. I thank you very much for your patient attention.

DISCUSSION OF DR. LOTZ'S PAPER, "GO TO THE BOOKS."

BY J. F. F. WALTZ, DECATUR.

Dr. Lotz's paper treats of a subject that is particularly timely and was probably inspired by recognition of the trend in these war

times to get down to bed rock and anchor one's self firmly to essentials and fundamentals. The value of reading the books of our literature is too apparent to call for discussion and here we would call attention to one of the best paragraphs in the paper. "Beyond the shadow of a doubt the men who do big things differ from those who don't chiefly in the activity of their minds. The big doers keep up a continual mental struggle, collecting and absorbing new facts, studying to understand them, trying to put two and two together, until out of this activity they hit upon good practical ideas which they see clearly. *No mentally lazy man ever had a really good idea.* Good ideas are born in brains that keep working."

As to the many changes to be wrought as results of the war not one of us but has been lost many times in speculation over some particular phase and, as the essayist suggests, the impetus given to thinking among the soldier boys will undoubtedly be felt by our profession as we come to serve the returned men. A keenness on their part to understand will make it necessary that we understand pretty clearly the technical and scientific basis of whatever procedure our service to them may involve. Our place as a profession will be more correctly gauged than ever before probably, and we should be qualified, for example, to outline the metallurgy of dental amalgams in response to the query, "What is amalgam made of, doctor?" as we are engaged perhaps in some amalgam work for these veterans of an intensive training.

Recently a dental friend had as a patient a General Electric Company Research Laboratory man, a graduate of Yale Sheffield Scientific School, and during the making of some silicate fillings a query was made as to the chemical nature of the material being used. The previous evening the dentist had read from his journals a paper upon this very subject with the discussions that followed and consequently was able to inform his patient in some detail. Calling attention to some tantalum instruments being used the patient in turn gave the dentist an interesting description of some work done upon tantalum in the General Electric Laboratory. Further discussion led to the dentist's speaking of the work our National Research Commission has done with substitutes for platinum, mention being made of the use of tungsten in dentistry. Later, through a mutual friend, the dentist heard his patient had been impressed, that "this dentist evidently was a man who read and did some think-

ing" and this thought led the patient to feel the dentist was unusual and a type of man standing out from the average of his calling, for, said he: "That fellow does dentistry for my family from now forward—he struck me as a 'crackerjack.'" A pretty good illustration of the value of a little information gained through journal reading; not so much because the dentist had won some patients as because he had created a center of influence that would reflect progressive dental development.

Are dentists a non-reading profession? The paper raises the question. From observation I must say I do not believe most dentists do much reading of their professional literature, though I think the majority of them may take some dental journals. With Dr. Lotz I feel glad our society members *have* to take two such good journals as the National Association Journal and the DENTAL REVIEW.

We wish most of our men to be progressive—readers, thinkers and doers of things worth while. Why is it not so to a greater degree? I incline to a belief the conditions of early training account for most of the lack. During my time in dental school too many men were attracted to study dentistry from the mistaken view it offered a good income with pleasant, easy effort; it looked like a better "job" and hence we had grocery clerks and livery stable hands going through dental college to become dentists of a class whose early training made it seem certain many of them would never become progressive through study, they were not built that way. Are not these men more than others the ones most interested in the purely business side of dentistry?—the men who tell of their "cash receipts" with enthusiasm but whose pride in the standard of their service is of small moment and whose patients one cannot help thinking of as having been exploited more than as having been rendered approved service?

How to correct this condition both in ourselves and the other fellow we have all pondered. Perhaps it never can be entirely corrected but it will be much improved. An enlightened public will force-improvement most rapidly but reading and dental meeting attendance are "first aid treatments" in any case, both as a means of fixing formation in our minds and again through the inspirational effect of contact with doers and thinkers. The process is one of development and an important part consists in college entrance re-

quirements being gauged to admit a larger percentage of student-type candidates as against the commercial, merchant-like type. How can such requirements be built up? I do not know any more than I know how Dental Boards can be safeguarded against licensing the unfit in every instance, but this again is a development to be hoped for. Surely both are possible of attainment and some day will be realized.

The references to the need for a dental literature index are excellent and the scheme offered is worthy of trial. The Dental Library Association may be the means through which to work to this end. About 1911 our Society subscribed to the Dental Index Bureau, which gave promise of being about to do this thing for us, but in common with the essayist I do not know what form of malady the Bureau may have become prey to—perhaps it is still a lustily crowing infant of some six or seven years, just recovering from some child's disease and is yet to attain a stalwart growth. Suppose upon arrival home your reception room holds for your consideration a broken jaw case and that you have only once before or perhaps never before been so signally honored. After a preliminary bit of sparring for wind you decide to "go to the books" of bound journals for a little survey of jaw fracture literature, and right then how much would you not give for a proper Dental Index! Some experiences of this kind or an effort to review what has been written upon a subject upon which you are asked to write a paper bring us to a "fondly do we hope, fervently do we pray" attitude toward any index project. Dr. Arthur Black's fine work at the time of the Golden Jubilee Meeting made us feel "he is the man" but he must be getting older even if he doesn't look or act it.

With the essayist I miss the good effect of the monthly greeting from the patriarchs of the abandoned REVIEW cover and plead for its return if not permanently then occasionally, as on the Editor's birthday or the anniversary of the date Germany is to be subdued, whenever that glad day may come.

True we do not read because we are tired, oh so tired, and have other diversions in the evening, but never shall we get any worth while habit if we make such makeshift excuse. We simply have got to discipline ourselves to do some things and if we are to be progressive we must read and let some diversify-

ments go hang. Gasoline and tires never were less compatible with a dentist's income than now, and these can well be subjected to a little absent treatment with less income atrophy while some time or worry-freed energy is set to work in better treatment of our journals. I often think too much day-end fag is more the result of a mental attitude than a physical condition—it's nice to indulge in some self-pity and sweet to have wife sympathetically remark "you must be tired, dear, you look it," but sit down and read some of the "Latest Focal Infection Excitement" or "A Great Discovery—The Roentgenograms Do Not Recognize Chloro-Percha as a Member in Good Standing of the Order of Root Filling Assassins," and you'll forget all about being weary. It's great! This is a fact to be demonstrated by one's self upon trial. Edison and other doers don't let the round of hours from 9 to 5 unfit themselves for all other hours of the 24 and neither do the doers of our calling. Let us have less patience with the coddling weariness excuse and be a little more progressive by being less often "fagged out."

Personally I think more of reading at home than in the office during business hours for such effort at the office tends to discourage the other. The year's journals are bound and taken home where they furnish many hours of profitable and pleasant reading of those articles not gone over when the journal arrived, and in compact volume are convenient to hand on the library table.

This paper has aimed at a target plainly worthy of being shot at. When home let us admit it scored a hit by reading with some system our monthly journals which as a daily or frequent habit will more than anything else entertain and instruct us.

DR. G. H. HENDERSON (Chicago):

I just want to make one statement in view of that made by the essayist on the question of our boys in France reading. I have a nephew in France—in his third year of service—and he writes to me and to his mother, who has charge of his money and his bank account, and in almost every letter he orders her to buy from his bank account some books, and he says emphatically and repeatedly that he does not want trash; he orders Thackeray and such books as that, and he says they are read not only by him but his associates. Our boys in France are

doing more reading than we have any idea of, and it is up to us to supply them. Do not be afraid to send good literature to France. My nephew is in the Canadian Army and the reading he does would surprise you. He asks for magazines and good literature.

DR. ARTHUR BLACK (Chicago):

I would like to say a word about the index of dental literature and what has been accomplished. The only thing that has prevented the publication of this index has been the financial difficulty. The Institute of Dental Teachers, composed of the dental colleges of this country, have heretofore failed to get together enough funds for publication. I have for several years employed in my own private library a woman whom I have trained to do this indexing, and I have some 60,000 articles indexed, dating from 1839. We have also an index of three British journals, three Canadian, two Australian, one New Zealand, and practically all of the journals published in this country, almost finished for the years 1911 to 1917 and this is now being prepared to send to the printer.

The Institute has plans under way to raise funds sufficient for this purpose. I am perfectly willing and in fact have already done the indexing, but I have not felt it is up to me to find the funds to publish it. Whenever they are ready to publish it, they are very welcome to it.

DR. EDMUND NOYES (Chicago):

I have entered my plea a good many times for more reading and study of professional journals and text books. Many of the papers published ought to be read by every man in the profession, and lately there has been a greatly increased feeling of encouragement in my own mind in regard to the future prospects in this respect, for two or three reasons. The first is the increasing necessity for a closer association with the medical profession, and while many medical men do not read very much they read more than we do, and our men must read if they would meet medical men on an equal footing. There is another important source of encouragement in the manner in which some of our schools have been doing their teaching within the last year or two, diminishing the number of lectures and substituting recitations from text books. The school in which I

give a few lectures is teaching the students to read to a greater extent than ever before in the history of dental education. Reading my own examination papers has given me conclusive evidence that in my department the students have been reading. The plan of conducting courses of study in the past two years has given an opportunity and inducement for a greater amount of reading and we cannot hope to have a reading profession unless we have reading students. As long as the dental students can go to school and listen to lectures and do laboratory work and graduate with very scant attention to any books except such technical books as anatomy and chemistry, and as long as the students sell their books at the end of each year to undergraduates instead of keeping them, we cannot hope that the profession of dentistry will be a reading profession. But we shall make progress in this respect, and great progress.

DR. C. N. JOHNSON (Chicago):

I feel that this paper is a very important one for this association. It is along lines that have interested me for many years and I want to compliment the essayist on the presentation of this subject. The statement has been made by him and others that dentists are not a reading profession. I never hear that without feeling that probably there is a slight misconception. If you men occupied the position I do, and received the correspondence I do about articles that are published you might change your mind. I want to say that this profession is a reading profession, and more and more the times are proving that. Considering the relative number in the profession there is a great increase in the reading of books on dentistry. There never was a time when so many books on dentistry were being sold as today. I do not feel like hanging my head when the dental profession is compared with others in the matter of reading. I believe we will compare very favorably with the medical profession, so far as readers are concerned.

I want to refer to a statement made by the essayist that there are seven hundred thousand of our soldiers who cannot read or write. When he made that statement it staggered me. They are taken, of course, from all walks of life, but if this be true it is one of the most discouraging things that I have heard in connection with the rising generation. If the war does noth-

ing else than instill in them the fact that it is necessary to have knowledge in this world it has not been in vain. I am glad to hear that there has been such a movement to encourage the young men in the army to read.

Dr. Lotz made the significant statement that the mind grows old slowly, and I would like to say that the cultivation of a taste for reading determines that more than any other one thing. Your mind will not grow old if it is used. I enjoy reading today more than I ever did and I get more pleasure and zest and inspiration out of it. I hope this paper when published will imbue the members with such a spirit that they will go back to the books. No man will find his declining years hanging heavily on his hands if he has developed a love for books.

PRESENTATION OF SERVICE FLAG TO ILLINOIS STATE DENTAL SOCIETY.

By DR. GEO. D. SITHERWOOD (Bloomington).

Mr. President, Ladies and Gentlemen: I am here to make a short address on the part of Dr. C. M. Meade and Dr. Mary B. Meade, of Carmi, Illinois, who are unable to be present at this time.

I have been selected—not on account of my youth. In July, 1863, I enlisted in the cavalry of the Union Army and after that went into the signal corps in February, 1864. In both places I was made bugler on account of my youth and musical abilities. While in Washington in 1864 as a bugler in the Signal Camp of Instruction I was privileged to attend the concerts given by the Marine Band at the White House on Wednesday afternoons, and always at the close of the concert they played the "Soldiers' Chorus" from Faust, and then Abraham Lincoln came walking down the steps. They always played that march at the close of the concerts, but I did not appreciate at the time what it meant. I learned afterward that in the opera of Faust that march means the end of war, and Abraham Lincoln was always looking for the end of the war. I was there when Colonel Early with his army attacked the Capital, when he could have taken Washington City but did not know it. It thrills me yet to speak of those days, especially when I remember how General Grant sent the old Sixth Army Corps and saved the city. Then I was sent to the South and was at Hilton Head, S. C., and also at

Fort Pulaski, Ga. I am relating these few incidents to give you an idea of what our Flag means to us. At Fort Pulaski, at the close of the war, there were many prisoners, such men as Ex-Governor Allison of Florida, Ex-Governor McGrath of South Carolina, R. M. T. Hunter of Virginia, Judge Campbell of Mississippi, and many other such men, and as I knew more of these men I learned that they were just as good and just as earnest and honest in their purpose as we of the North. I have never forgotten the lesson that I learned there, but am glad to say, we have not two flags but one flag in this great country today. (Applause.) I remember at one time at Fort Pulaski, which is on a small island at the mouth of the Savannah river, that one morning I saw Judge Campbell, a splendid looking man with long white hair, marching up and down the levee, a negro soldier guarding him, and as I came near I heard him repeat these words: "My God, my God; that I should have ever come to this. A prisoner in my country and a nigger guarding me!" You notice that at the front of this pulpit are five flags—two of our own and the flags of Great Britain, France and Italy. They were presented by a business man of Bloomington, and this large American flag to the left was given by the members of the Ladies' Auxiliary of the G. A. R. (Applause.) In 1890 I was in Berlin with my wife attending the International Medical and Dental Congress, and as we went into the great hall there were flags of all the nations, representing the men that were assembled there, and as my wife and I sat there we were united in our opinion that the flag of the United States was the most beautiful of all the flags. (Applause.) The Civil War, was such a terrible thing to me that I have never talked very much about it, but I have adopted as my motto since then: "Look not mournfully into the past, it comes not back again; wisely improve the present, it is thine. Go forth to meet the shadowy future without fear and with a manly heart."

Betsy Ross certainly gave us a very beautiful flag.

"The union of lakes, the union of land,

The union of States none can sever;

The union of hearts, the union of hands,

And the Flag of our Union for ever."

In harmony with the red, white and blue of our beautiful

Flag with its stars and stripes, is the appropriate service flag that has appeared in the great world war that is now raging. The same color scheme prevails, the white center filled in with blue stars, and a wide red border—a star for every man who gives his service as a soldier.

Mr. President, I have the honor in behalf of the Doctors Meade to present to the Illinois State Dental Society this large and beautiful service flag with the seventy stars, which I feel confident will soon be increased to 100. (Applause.)

THE PRESIDENT:

It is very gratifying to me to receive from the hands of a man who took part in the Civil War this tribute to the young men who are serving in the war today. The same spirit which prompted Dr. Sitherwood to take up arms for the defense of our country, prompted the Doctors Meade of Carmi to make this beautiful service flag. I refer to the spirit of patriotism which dominates every red-blooded American. It is with a special sense of appreciation that in this second year of our entry into this war for humanity the Illinois State Dental Society accepts this service flag. We are proud of the men whose sacrifices have made this flag possible. We are truly thankful to Doctor C. M. Meade and Doctor Mary B. Meade for this beautiful flag and the patriotic impulse which prompted this cherished gift. (Applause.)

LETTER FROM DRS. MEADE.

Carmi, Illinois, May 13, 1918.

To Illinois State Dental Society,

Dr. J. P. Luthringer, Secretary.

Dear Doctor: We have sent you the Service Flag by parcel post, and may it give to the Society the same pleasure to receive it that it does to the donors to give it. The greatest honor one can confer on the men represented by these stars is a very small token of the appreciation of what they are doing for us.

We are very sorry we cannot be present for the splendid program, but we wish you all a most profitable meeting.

Sincerely and Fraternaly yours,

C. M. and MARY B. MEADE.

DR. J. P. LUTHRINGER (Peoria):

In my capacity as Secretary it now becomes my very pleas-

ant duty to read the names of our members who are now in the Army.

LIST OF MEMBERS OF ILLINOIS STATE DENTAL SOCIETY IN SERVICE.

Chicago Dental Society.

Aison, Emil A.—Base Hospital, Camp Grant, Illinois.

Cerney, James C.—D. R. C. Base Hospital, Camp Sheridan, Ala., (Lieut.).

Clopper, Paul W.—Polo, Illinois.

Collins, John J.—2411 Lincoln Ave., Chicago.

Daniels, C. L.—209 South State St., Chicago.

Davy, Oakley B.—1619 Sherman Ave., Evanston.

Deist, M. W.—840 South Oak Park Ave., Oak Park.

Eisenstadt, Jos.—5416 Ingleside Ave., Chicago.

Freeman, Chas. W.—25 E. Washington St., Chicago.

Frost, G. N.—c/o Military Police, Camp Dodge, Iowa.

Gale, Frank W.—81 East Madison St., Chicago.

Gallagher, John C.—25 East Washington St., Chicago.

Gallie, D. M., Jr.—Reliance Building, Chicago.

Garriott, J. P.—4770 Lincoln Ave., Chicago.

Harris, J. Earl—805 East Forty-seventh St., Chicago.

Hennis, H. W.—Elmhurst.

Herzberg, E. I.—5052 Cottage Grove Ave., Chicago.

Kellogg, John S.—1269 Ardmore Ave., c/o Grigsby, Chicago.

Kolar, O. J.—3957 West Sixteenth St., Chicago.

Krakow, G. J.—La Grange.

Kubacki, W. H.—1251 North Artesian Ave., Chicago.

La Grow, A. J.—1st Corps School, A. P. O. 703, A. E. F., France, via New York, N. Y., (Lieut.).

Lane, C. Lynford, 365th Regiment, Barracks No. 1350, Camp Grant, Ill.

Leach, F. D.—25 East Washington St., Chicago.

Leonard, L. A.—622 Davis St., Evanston.

Logan, W. H. G., Surgeon General's Office, Washington, D. C., (Colonel).

Mathison, W. E., Camp Meade, Md.

Meredith, J. L., c/o Base Hospital, Camp Grant, Ill.

Orr, H. N.—7411 Greenview Ave., Chicago.

Platts, L. A.—France—Milton, Wisc.

Postle, M. M.—Crede, W. Va.

- Pruyn, Walter M.—108 North State St., Chicago.
 Ross, J. Harry, Jr., Dental Corps, 21st Engineers, A. E. F., via
 New York.
 Scanlan, Walter R.—3644 Ellis Park, Chicago.
 Schaefer, J. E.—1511 East Fifty-seventh St., Chicago.
 Schultz, Louis—25 East Washington St., Chicago.
 Shay, Wm. G.—2nd Illinois Infantry, Houston, Texas.
 Smith, Kenneth F.—2136 Indiana Ave., Chicago.
 Thomitz, John R.—Co. I, Depot Brigade 161, Bldg. 1157 W., Camp
 Grant, Ill.
 Wadsworth, Henry P.—25 East Washington St., Chicago.
 Young, E. T.—30 North Michigan Ave., Chicago.
 Zajicek, E. C.—Dental Surgeon, U. S. N. R. F., Camp Dewey, Great
 Lakes, Ill.

Central Illinois Dental Society.

- White, Walter L.—Shelbyville, Ill.

Eastern Illinois Dental Society.

- Henn, E. J.—(Brocton), 344th Infantry, Camp Grant, Ill.
 Woods, F. R.—(Kansas, Ill.), D. R. C., Camp Pike, Ark.

Fox River Valley Dental Society.

- Abbott, Gordon M.—(St. Charles), U. S. Army.
 Chappell, Ora—(Elgin), U. S. Army.
 Cigrand, B. J.—(Batavia), U. S. Navy Dental Corps (Lieut.).
 Donlevy, Frank D.—(Aurora), U. S. Army.
 Hoadley, Paul—(Yorkville), U. S. Army.
 Johnson, Gifford A.—(Batavia), Army Med. Corps.
 Smith, Harry—(Aurora), U. S. Army.
 Spickerman, A. C.—(De Kalb), U. S. Army.
 Spickerman, J. A.—(De Kalb), U. S. Army.
 Willman, J.—(Elgin), U. S. Army.

Kankakee District Dental Society.

- C. R. Hollister—(Manteno), Dental Corps, Fort Snelling, Minn.

La Salle County Dental Society.

- Daniels, Leo V.—(Peru), M. O. F. C. Quarters No. 14, Ft. Riley,
 Kans., (Lieut.).
 Karr, G. A.—(Ottawa), Sanitary Detachment, 3rd Ill. Inf., Camp
 Logan, Tex.
 Nertney, Edward George—(La Salle).
 Sullivan, E. F.—(Ottawa), Camp Grant, Rockford, Ill.

Macon-Moultrie County Dental Society.

Bachman, H. J.—(Decatur), U. S. Military Academy, West Point, N. Y., (Major).

Cassell, C. Leonard—(Decatur), somewhere in France.

Elslager, H. H.—(Decatur), somewhere in France, (Lieut.).

Parkinson, C. B.—(St. Louis, Mo.), somewhere in France.

Madison County District Dental Society.

Dean, H. T.—(Wood River), 78th F. A., Camp Logan, Houston, Tex.

Fink, Leroy M.—(Edwardsville, Ill.)

Kane, F. M.—(Alton.)

McDonough-Fulton County Dental Society.

Jackson, C. P.—(Macomb), D. R. C., Camp Pike, Little Rock, Ark., (Lieut.).

McLean County Dental Society.

Muzzy, L. B.—(Odell), Scott Field, Belleville, Ill., (Lieut.).

Morgan County Dental Society.

Applebee, Alpha B.—(Jacksonville), Great Lakes Naval Station.

Wood, Arthur C.—(Jacksonville), Camp Grant, Ill., (Lieut.).

Peoria County Dental Society.

Blocker, E. T.—(Canton), 336 Artillery Hospital, Camp Pike, Ark., (Lieut.).

Jacob, L. H.—(Peoria), 352nd Infantry, Camp Dodge, Iowa, (Lieut.).

Rock Island County Dental Society.

Bigler, J. A.—(East Moline, Ill.)

Wiggins, S. A.—(Rock Island, Ill.)

King, Elbert W.—(Geneseo), Ft. Sheridan, Ill., (Lieut.).

Sangamo-Menard County Dental Society.

Mills, Geo. W. (Springfield).

Munroe, Ogden B.—(Springfield), Camp Greenleaf, Oglethorpe, Ga.

Southern Illinois District Dental Society.

Croessmann, J. W.—(DuQuoin), Camp Bradley, Peoria, Ill., (Lieut.).

Dains, F. W.—(Willisville), 347th Infantry, Camp Pike, Ark., (Lieut.).

Duncan, C. E.—(Marion), Camp Grant, Ill.

Ferguson, J. W.—(Marion), Camp Pike, Ark.

Kimbro, E. C. (Anna), 123rd F. A., Camp Logan, Houston, Tex.,
(Lieut.).

St. Clair District Dental Society.

Milsteadt, D. D.—(East St. Louis), Camp Pike Hospital, Little
Rock, Ark.

Weir, H. O.—(Sparta).

Warren County Dental Society.

Evey, J. M.—(Monmouth), Headquarters Company, 123 Heavy F.
A, Camp Logan, Houston, Tex., (Captain).

Will-Grundy County Dental Society.

Fehrenbacher, F. J.—(Plainfield), Camp Hospital, Camp Pike, Ark.

DR. G. H. SITHERWOOD:

I would like to call attention also to the service flag of this
congregation which has forty-eight stars in it. (Applause.)

DR. L. L. DAVIS (Chicago):

I think it only fitting at this time to offer a motion asking
the Chair to appoint a committee to draw up suitable resolutions
which may be sent to Doctor and Mrs. Meade, and thanking
them for this beautiful flag which they have presented to this
Society.

(Motion seconded and unanimously carried).

[The report of this committee will be found in the minutes
of the meeting which will be published in the volume of Trans-
actions.—Editor.]

REPORT OF THE PREPAREDNESS LEAGUE.

DR. D. M. GALLIE, (Chicago):

Mr. President and Members of the Society: I think that I
speak for all the members of the Illinois Society in compliment-
ing the Program Committee on the arrangement of this patri-
otic service. I do not believe in these days that any gathering
or convention should meet without devoting some considerable
time to a service like this. Many of you have sons in the serv-
ice, brothers, husbands or sweethearts, and I am sure everyone
here was thrilled at the presentation of this flag—and the sight
of those sixty-seven stars, representing those that are most dear
to us. I am sure it makes us all more determined that “they
shall not pass.” (Applause.) Whenever I see the presentation

of a flag like this or whenever I see the soldiers marching down the street, I am reminded of a little incident that happened in our city about two years ago. A Highland regiment was leaving and as they marched down the street, these Kilties in their plaids, a little old lady who stood near my wife said, "God bless you, laddies; you may no come back again but I ken you will gie a good account o' yourselves." And I am sure the men whom this flag represents, sixty-seven of our boys, while they may not come back again, will give a good account of themselves. (Applause.) And in order that they may give a good account of themselves, fighting our battles, offering their lives for us, we must give a good account of ourselves here. The Dentists have a great opportunity to show their interest today in taking care of the boys who are going to fight our battles and seeing that their mouths are put into proper condition. We are recognized today as never before by the Government—on the same equality of the physician and surgeon, and the Government looks to us to do that which we have promised to do. They expect great things and we must see that they are not disappointed. Very few States in the Union have been honored as Illinois has. We have in Washington a man who is at the head of the whole Dental Department—Colonel Logan. He went there a few months ago as a civilian; he was promoted to major and now has been made colonel. So it is up to the Illinois Society to do more than any other State Society, because we have the greatest Society in the way of membership; we have a Society that has a record for doing big things, so they expect us to do our share and a little more in the way of membership in the Preparedness League of American Dentists. You are all familiar with this organization, but as the representative of Illinois appointed by the authorities, I make this plea that everyone of you enroll yourselves as members of the Preparedness League of American Dentists. The membership of all the States of the Union will be published and we cannot allow our State to be improperly represented. We must have a large percentage of the members in this Preparedness League. They are to publish the amount of work done by the different units, so we must organize this State so that Illinois will stand foremost among the States in the work they have done. We need the help of every one

of you to bring up our Society to the standard. We have in the State of Illinois four thousand dentists and we have six hundred members in the League. We must have more than that. Tonight we will pass slips around that you may sign and send in to Dr. Waugh and then later send one dollar. It is not a dollar a year but one dollar all told.

I will ask Dr. West to read a resolution similar to one passed by the Chicago Dental Society and I know we will have your unanimous support of this resolution.

“Whereas, The Illinois State Dental Society, realizing the importance of healthy mouths and clean teeth as absolutely essential to the preservation of good health; and

Whereas, Our government is calling into the service of the Army and Navy many thousands of young men who are lacking in these requirements and therefore cannot qualify for these duties without the aid of the dentist, and such service cannot be rendered by the government until they are accepted; therefore, be it

Resolved, by the Illinois State Dental Society, That it shall be the public duty of every member of this Society to render to every volunteer or selective service man that may be referred to him by the proper authorities, such professional service as may be necessary to make him dentally fit. When the volunteer or selective service man is unable to pay for such service the same will be rendered free of charge.

“GEORGE N. WEST.”

(Moved that this resolution be adopted; motion seconded and unanimously carried.)

MISSOURI STATE DENTAL ASSOCIATION, FIFTY-
THIRD ANNUAL MEETING, HELD AT COLUMBIA,
APRIL 1, 2, 3, 1918.

ADDRESS BY MAJOR JAMES P. HARPER OUTLINING THE WORK OF THE
DENTAL BOARD AS APPLIED TO THE DRAFT CONTINGENT.

Last fall the Governor of Missouri, through the Adjutant General and the President of this Association, requested the dentists

of Missouri to render every assistance in their power to see that the selected men before their enrollment have their teeth properly fixed, and assist in every way to render these men physically fit. To carry out the details of that work, it was considered advisable to have some official representative of the dentists on the different medical boards of the local advisory boards. An effort was first made to have a dentist officially appointed on every local board. Unfortunately the membership of the local draft boards was limited by Congressional action to five. The Adjutant General regretted that the law was such that he could not appoint men officially as members of the local board, but it was thought advisable that a dentist be selected for every board that has to deal with the physical examination of the selected men, and I have been authorized to tell you what I could do in the case of dentists who would volunteer to serve with the Medical Board. In time, this situation will be corrected and we will have a dentist officially a member of the local board, but as it stands now, they will be merely members of the Medical Advisory Board.

The object in having men appointed was to have the dentists in touch with the selected men, and this is to assist the work of the Preparedness League. There are many men who are members of the Preparedness League who have sent in their dollar and quit at that. They are willing to do the work that comes to them, but the work does not come to them. While in a great many portions of the State we are doing splendid work, I find that in some communities they are simply tangled up with red tape. They do not seem to grasp the situation. They seem to feel after they have signed up to assist the Government in this work, the Government must bring the men to them and put them in the chair and make them open their mouths. The patriotism of many dentists is latent. I ask them what they are doing. They say, we are not doing much yet; we have not got organized; we are waiting. I tell them, Why don't you write to those men and have them come in? They come back at me with the question, "What is the Government doing, in paying these men in the Dental Corps to go down to the camps and do this work?" The men in control of the Surgeon General's Department have more work than they can do. If we send the men

down with their mouths fixed up in good shape, the chances are that for at least two years, those men will not be a liability to the government. There will always be sufficient emergency work to keep the small proportion of dentists in the army busy and more than busy, and unless we do our part by sending these men down there well equipped orally, the dental surgeons and the expert dentists in the corps will be snowed under with routine work of putting in amalgam fillings and so forth. We can readily do this work. The pro rata among the dentists of the State of Missouri will not be two men apiece today. Take it here in Columbia. I do not know what they are doing here at Columbia. I think they claim 10,000 population. It is probable that in the next call for the draft there will be 150 men to go out. Of that 150 men, half of them will be well fixed and will not need any dental service; that will leave 75 men. Of this 75 men, fully half of them will go to their own dentists, if their attention is called to it, and these will take care of their work. That leaves 35 or 40 men, and to take care of them there are ten dentists in Columbia—about four men apiece.

A MEMBER:

There are only about eight members of the State Association in this city.

MAJOR HARPER:

Eight men can readily take care of the dental service of those men in the next six months. If you wait until they hunt you up, however, there will be practically nothing done. The man who needs dental service is the man who does not voluntarily go to the dental office until he has the toothache. He will not go to the dentist just on account of five or six cavities in his mouth to have them attended to, until he is actually suffering. So it is your duty to have them come to you and see that the necessary work is done. It will not be a big task; it amounts to nothing to you. Don't let your patriotism be latent.

The trouble is there is too much waiting for someone to guide. Some of the dentists say "I have devoted two hours a week, on Mondays from 8 to 9, and on Fridays, from 5 to 6." In other words they are patriotic two hours a week. I suggest that you treat them like any other white patient, even if they are white soldiers. I suggest that you write to "John Smith" to

report at ten o'clock next Monday morning, and then don't think your duty is done if you do not go to see John Smith in case he fails to respond.

My instructions in doing this work are to see that the soldiers get preferential treatment and that everything else is set aside for the soldier. I don't put him in the category of certain hours that they can come, as if I am doing charity work. I want you to go at this work in the proper spirit. It would seem that you are all waiting for somebody to do the work. You have plenty of time to do it before the men are called out. Now, let me hear your problems.

A MEMBER:

I would like to ask, are we to wait until the local board has passed on the men before we work on them, or are we to attend them simply because they are in the draft?

MAJOR HARPER:

That is a pertinent question. I can see there would be danger, if you did not wait until the board passed on them, that you might do some work for a man that was not going; but my method in St. Louis is to take every man in Class A. I take every man that comes in with a ticket for Class A. I take it for granted he is selected, although he may not go in six months, or that the war might even be over before he is called out. I do not care, if he is in Class A; I do not wait until the hurry up call comes and then try to take care of a hundred and twenty men in a couple of evenings. If you clean up the Class A men in this town, it is not a very great task. The Class A men usually have their own dentists; and take them in this town, the men in that class who need free dental service are not many.

A MEMBER:

We have been doing more or less work for the soldiers in our community without discriminating as to the class they are in. I took it upon myself, because I was a member of the board, to go to the president of the board and try to ascertain the names of the Class A men in order to get to them. He informed me that they had been sent in and that there was no way of getting at the Class A men at this time. I thought that was rather strange.

MAJOR HARPER:

He must have had a record, or else when the Adjutant General sends for certain men in Class A how would they know a thing about it. You will encounter that kind of obstruction in every board and you will have to overcome those things the best way you can. I find in some communities, there are dentists who are not really members of the board, who are running the whole board, and men appointed on the local advisory board allow themselves to be frozen out because some physician on the board runs the whole show. All you can do, when you encounter trouble with a board of that kind is to be diplomatic and do the best you can.

As I have explained, we cannot assert our rights. The duty of the dentist on the local board is to come in touch with the physicians, explain what we are trying to do, to use diplomacy and tact, try to make himself useful and do everything he can to help along the work of getting the selected men to the dentist willing to do the work. If you find men on those boards who obstruct, don't allow your patriotism to be discouraged. Explain to physicians who are sufficiently intelligent to appreciate the value of dentistry, how necessary it is, that it is being done at the request of the Government. You do not want to oppose the board, but you want to help in this work. In this way you will find in a majority of cases you can keep in touch with the situation.

A MEMBER:

Wouldn't it be a good idea to define the duties of those who are appointed on the advisory board and those who are appointed on the local board?

MAJOR HARPER:

We have been over that. I thought I explained, that the man on the advisory board is a member of that board as much as any other man. The man on the local board is merely there in an advisory capacity to help the physician. He is there as a specialist on that particular branch.

DR. DONALD MCKAY GALLIE of Chicago was then requested to address the members, and spoke as follows:

Major Harper and Gentlemen: I am afraid I am the poorest one to be called upon to take part in this discussion. While I

am a member of the Preparedness League and of the National Council Medical Board, I have been so busy with other activities, I have not been in as close touch with this work as I should have been. But I know something about the work being done in our State, because my associate is Chairman of the Board of the State of Illinois.

I will say we missed our opportunity in the State in not getting organized at the same time the local board started their work of examination. We only woke up when it was almost over, although we made every effort. We found there were a few dentists who would not take part in this work. They are not very ambitious about going out and gathering men in. I can understand how that is the situation in a big city like Chicago. In the small towns you have no difficulty whatever, and in cities of from 25,000 people down, the work could be very easily handled, and it is easy to get the names of the quota, and after this Class A quota has been accepted, it is your duty to send a card to them, and let them know you are ready to treat them, if they desire service. Of course, many of them will hang back; they will not want to come to the dentist, as they think they are getting along all right. At the same time there are many who will take advantage of the offer.

There is more trouble in the large cities, especially where there is a great foreign population. In the city of Chicago we have 87 local boards, and to have a dentist in some advisory capacity would mean eighty-seven dentists would have to give their time two times a week in which they meet a stream of men coming in. The Board of Examiners haven't the time to talk to this and that man, and tell him he should see a dentist.

We tried last fall to get in touch with the men. The local boards informed us they could not turn over the books to us at that time so we could get their names, consequently we had little success.

In this last call, we endeavored to start soon enough; we have gone around to a great number of local boards and we have a record of all classes assigned in those boards we have visited. We were advised that if we could get a request from the Adjutant General or a letter from the Governor, they would turn over to us the names of the men in Class One, and this we

have done. We have divided the work into seven branches in Chicago and have proportioned them in relation to the different boards.

We hope to get hold of and fit out many of these men that would otherwise go to the camps and who in a short time would be in sore distress.

The way things appear now, this war is going to last longer than we thought. It is well for all of us to get organized and get things in shape, as soon as the draft board starts in on the examinations. Those who did not start in early enough should endeavor to get the names of the Class A men because they are the men accepted and consequently you will not give free service to some man who is not going to serve his country.

It is a wonderful work we are doing for them, and yet it is only a small sacrifice we are called upon to render compared with the great sacrifice of the man who is giving himself for his country. I know that when this great trouble is over, it will place dentistry away above where it has ever stood in your localities, and in the eyes of the Government. It will be some little inconvenience to you and cost you a little, but it is worth while, and you will be able to say you have contributed your bit.

MAJOR HARPER:

In answer to a question of one of the members, as to whether the names of the first class men could be furnished, I will say that I will get the name of all first class men, and if you write me I will see that you have them.



THE DENTAL REVIEW

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EDITORIAL.

THE RECENT MEETING OF THE NATIONAL DENTAL ASSOCIATION.

The 1918 meeting of the National Dental Association has passed into history. The event is so recent that it gives one a glow when one thinks of it. To say that it was a very great meeting is to express in the mildest possible manner what was an actual fact. Never before have so many dentists congregated together in the history of the profession, and never has there been such incessant activity of dental thought along so many lines. The exact figures of those in attendance are not available at this writing, but a very low estimate would place the number somewhere between 6,000 and 7,000. While the meeting was in progress there were many rumors that the attendance was reaching 10,000, and it might well have seemed so to those present, but nothing is ever gained by exaggeration, and the official figures will be looked for with interest. That it was much larger than any previous gathering of dentists has sufficiently been established. And when one thinks of it this is remarkable. There were so many agencies which were calculated to limit the attendance that it was a revelation to see such a large body of men gathering at Chicago. War conditions undoubtedly kept many away, those in the service being the very men who usually attend meetings. Then the increased railroad rates, coming just when they did, prevented a great number from attending, particularly from the far distant States. If it had been an average meeting in attendance it would have been remarkable, but when it turned out to be a record breaker it was an astonishment to all.

Then the machinery of the meeting ran very smoothly, due in

large measure to the executive ability of the President, Colonel Wm. H. G. Logan. His masterly management of the various activities of the convention, ably seconded by the efficient secretary, Dr. Otto U. King, and the various committees, contributed in no small degree to the great success of the meeting. -

Among the many notable features of the gathering there are some which stand out in bold relief. The two large patriotic meetings on Tuesday and Wednesday evenings in the Auditorium Theatre will never be forgotten by those in attendance. This immense theatre was packed on both occasions, and many were turned away. The decorations of the theatre were most artistic and beautiful, and the sight of those great audiences with the surroundings was very inspiring. The speakers on Tuesday evening were Dr. Joseph Nolin, of Montreal, Canada, President of the Canadian Dental Association ;Colonel Wm. H. G. Logan, President of the National Dental Association; Major-General William C. Gorgas, Surgeon General of the United States Army; Brigadier-General Robert E. Noble, of the Surgeon General's office; Colonel Charles H. Mayo, of Rochester, Minn., and Lt.-Col. Horace D. Arnold, chairman of the Council on Medical Education of the American Medical Association. On Wednesday evening those who spoke were Dr. Donald M. Gallie, of Chicago; Major C. Victor Vignes, of New Orleans; Senator Wm. E. Borah, of Boise, Idaho, and Lieut. Vasile Stoica, of the Roumanian Legation at Washington, D. C. The Jackie Band from the Great Lakes Naval Training Station furnished the music on these memorable occasions.

The effect of these two meetings on the public at large will not soon be forgotten. It was a vivid demonstration of the enlarged vision which the public is getting of the significance of dental service, not only in military channels but so far as the general body politic is concerned.

The Preparedness League of American Dentists came in for a great deal of attention at the 1918 meeting, and very justly so. When the members of an organization have on record more than half a million free dental operations for men about to enter the army, it is a concrete fact of philanthropy and patriotism which speaks louder than mere words. The League is an organization unique in itself, and it deserves the loyal support of every patriotic dentist.

A very pleasing feature of the National meeting this year was the presence in a body of the Canadian Dental Association. When the National organization of one country accepts an invitation from the National organization of another country to hold its meeting at the same time and place as a guest of the inviting body it is an indication of fraternal reciprocity such as has seldom been witnessed, and this meeting of these two associations will go down in dental history as a most auspicious event. The Canadian dentists contributed much in the way of addresses, papers and clinics to the program of the meeting, and the fraternizing of the members of the two bodies was most delightful.

One of the outstanding things associated with the recent meeting, and the thing that will probably live longest in the minds of those present, was the dedication of the monument to the late Dr. G. V. Black. Seldom have similar exercises been so impressive as were these. The oration was delivered by that very talented and eloquent speaker, Dr. A. W. Thornton, of Montreal, Canada, and in all the annals of dental gatherings there has never been pronounced a more fitting, a more learned, or a more masterful address than this. It was in every way worthy of the memory of the great man in whose honor it was delivered, as well as of the great man who delivered it. The exercises of unveiling in beautiful Lincoln Park will live forever in the memory of those who witnessed them. The environment was historic, the day perfect, and the throng of people an inspiration. No more auspicious event has ever been enacted in the history of dentistry.

There were only two circumstances which tended in any way to detract from the complete success of the 1918 meeting. One was the weather which was insufferably hot—jumping from a temperature which had ranged all summer in Chicago along in the 60's and 70's suddenly to 101—which was the record for heat in this city in August. The other was the fact that the immense size of the meeting militated against the individual touch with one's associates which is always so delightful. One searched in vain for one's personal friends, and ended by being caught in the crowd and carried with the tide.

But all in all the greatness of the meeting thrills one as one thinks of it, and its potency for good will extend on and on into many years to come.

THE EDITOR'S DESK

AN INTERESTING CASE.

The accompanying illustration shows a peculiar condition in the mouth of a boy aged seven. He was brought to the dentist with a wide space between his two upper central incisors, and a request made that the teeth be forced together. Before attempting



this an X-ray was made which disclosed the condition shown in the radiograph. Apparently there are two deciduous or supernumerary teeth lodged between the centrals which must be removed before the permanent teeth can be brought to position.

The natural query is, what would have happened if the attempt had been made to force these teeth together without consulting the X-ray? It is only another illustration of the great value of the radiograph in dentistry.

BOOK REVIEWS.

ARMY DENTISTRY. Forsyth Lectures for the Army Dental Reserve Corps. Edited by *Frederick A. Keyes, D. M. D.* 504 pages. Published by D. Appleton and Company, New York, 1918.

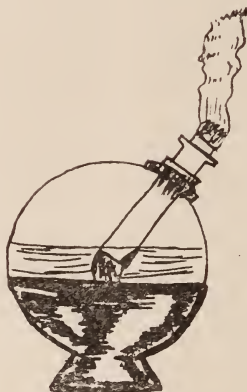
This book has a contributing list of seventeen men dealing with as many subjects, all of vital interest to the army dentist. The volume is made up for the most part of lectures given at the Forsyth Dental Infirmary, adhering as closely as possible to a course which was authorized by the Surgeon General of the Army and Navy. It is an excellent work, of value not only to the Army dentist but to the general practitioners as well. The author is entitled to the thanks of the profession for bringing out so useful a book at a very opportune time.

PRACTICAL HINTS

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Surfacing a Plaster Model:—Pulverized soap stone rubbed on a plaster model with a finger gives the model a smooth, polished finish as smooth as smooth glass or chinaware.—*H. A. Cross, Chicago, Ill.*

Alcohol Lamp:—Imagine a lamp used by jewelers, 7 inches high, with a five-eighth-inch diameter wick. A-a-a-h—there is an alcohol flame for you that will heat your chip blower quickly. Any jeweler supply house has them. It is a glass ball in a hollow brass base and can be tilted to angle to suit.—*Homer Almon.*



Advantages of the Indirect Method of Making Gold Inlays:—Time saved at the chair, more artistic results, greater assurance of fit through the possibility of correcting defects in inlay on the model before inlay is tried in the cavity in the mouth. Try it.—*F. E. Cheeseman, Chicago, Ill.*

Double-Ended Instruments:—My greatest time savers are double ended, cone socket instruments. When you are using a

stone in the mouth, how many mouth mirrors have you spoiled by just touching the mirror with the stone? With a double-ended instrument, an unground mirror on one end and a ground one in the other saves time and mirrors.—*Y. E. Whitmore, Little Rock, Ark.*

Soldering Contact Points on Inlays and Crowns:—The quickest and easiest way is to heat in the flame till red and then cool in the air which oxidizes the whole surface. Now by means of a toothpick (one of the very few uses a toothpick serves), place a smear of flux paste just over the area you wish the solder to flow; place a piece of solder and flow—it will not flow where there is no flux.—*Earle H. Thomas, Chicago, Ill.*

Exact Technic in Casting:—To enjoy real satisfaction in an accurate casting I would emphasize the suggestion made by Dr. A. H. Maves of Minneapolis, that a definite technic must be carried out. Take the matter of investing the wax model. You cannot allow it to set over night, to burn it out any old way, to cast it any old time and expect results. The following regulation in our laboratory with reference to this brings happy results:

Invest model at 9 A. M.

Allow it to dry until 10:30.

Set beside fire till 11.

On fire till 11:25.

Cast 11:45.

Don't disregard the little essentials and then cuss the art.—*J. H. Kolter, Wausau, Wis.*

To Restore Worn Lower Incisors:—Worn lower incisors, in the mouths of our elderly patients present a trying problem. Often they are abraded to a point of extreme sensitiveness, yet the pulps are not exposed, and the devitalization and subsequent pulp removal is very difficult. Gold crowns are possible in some cases but are always dirty and unsightly. Very many of these cases may be handled by trimming the tooth on both mesial and distal surfaces with a thin carborundum stone, thus making the tooth bluntly wedge shaped.

Lightly groove these ground surfaces with a fissure burr, taking care to make the groove as nearly as possible parallel with the long axis of the tooth. (These light grooves serve, in the finished inlay to prevent displacement in either anterior or posterior direction, and also act as guides when the inlay is placed in position.)

These preparatory steps having been taken, prepare and cast an inlay in the usual manner. Great care should be taken with the finishing when the work has been set to see that no slightly rough margin offers a chance for careless use of floss or pick to flip the inlay from its slender anchorage. Advantages of this method are that it conserves the vital pulp, requires little drilling, and that in a portion of the tooth where it is most easily tolerated, is very serviceable, and presents a minimum of gold.—*Arthur G. Smith, Peoria, Ill.*

Camouflaged Gold Crown:—A gold crown that is placed on any of six anterior or bicuspid teeth where it is visible is an unsightly object, and a blot on the dentist's esthetic ability. Sometimes in anchoring an anterior bridge, either upper or lower, it is desirable to use a cuspid or bicuspid for an abutment, using a gold shell crown. A fine esthetic effect is accomplished by making a nicely fitting gold shell crown in which the buccal side is somewhat flattened and to which a piece of 36 gauge pure gold plate is soldered. The piece of pure gold is first fitted to the outer side of the crown and a very slight rim turned up. It is then punched full of small holes with a plate punch and soldered on the gold crown. The crown is then treated in the usual way for securing the bridge, only it must be easy fitting enough to be pressed to place with a flat piece of wood similar to that used by the orthodontist in placing bands. When the bridge is finished, place on the roughened part of the crown where the pure gold is, such synthetic cement as will harmonize in color with the other teeth, and when it is fully hardened polish and set the bridge in the usual way. Suppose the synthetic enamel should be displaced, you can easily replace it in the mouth without rubber dam by using cotton rolls and saliva ejector. The result is very satisfactory in many ways. Where the crown is cast the wax may

be carved to form the space for the synthetic enamel the same as for a gold inlay facing. The possibilities for real artistic work by this method are many.—*Geo. D. Sitherwood, Bloomington, Ill.*

Matrices for Amalgam Fillings:—In my opinion the method of fastening matrices with a ligature is sloppy and uncertain. The ligature is liable to slip off and give way. Besides, 36 g. copper advocated is unnecessarily thick. A better way is to use a soldered steel matrix which can be made of thinner material and is secure, as well as quickly and easily made. You can make up a stock of them of all sizes you may need as follows: Get one of the stands used for holding seamless caps which consists of an oblong flat piece of wood with numbered upright cylindrical blocks. Get a sheet of the thinnest matrix steel. The S. S. White Company has it of a thinness almost of writing paper. Cut the steel into strips of convenient length, pinch around blocks, remove, hold pinched portion in appropriate pliers, flux joint with solution of zinc chlorid made by dropping a piece of zinc into hydrochloric acid, apply a small piece of soft solder and solder over alcohol lamp. Do not trim the soldered portion flush, but leave quite a little projection to give plenty of strength. You will, after a short experience, be able to pick a matrix which will fit or approximately fit the tooth you are working on. If the one you selected does not fit the tooth, find which of the cylindrical blocks it does fit. From that you can determine the exact size you want. You can then trim it if necessary to avoid irritation of gum, place on tooth, shape end of a stick of orange wood to fit between the teeth and hold cervical part of matrix against gingival wall, preventing overhang of filling. Do not cut your orange wood wedge to interfere with contour. With wedge in place, you are ready, after drying, etc., to fill. You will need about twelve sizes. Of those about six are most frequently used. You may rarely need a size larger than the largest of the blocks, which of course is easily made. It may sometimes be necessary to cut matrix before removing after hardening of filling. Generally I am able to remove without cutting after the filling has been left to harden sufficiently.

The matrix can then be washed, sterilized in flame or boiling water and used several times.—*Vincent Fischer, Chicago.*

MEMORANDA.

NORTHEASTERN DENTAL ASSOCIATION.

The Twenty-fourth Annual Meeting of the Northeastern Dental Association will be held October 10th, 11th, 12th, 1918, at the Narragansett Hotel, Providence, R. I.—Alvin A. Hunt, Secretary, Hartford, Conn.

PROCAIN AND NOVOCAIN IDENTICAL.

It appears that in certain quarters the attitude is taken that the local anesthetic sold as Procaïn is not identical with that marked as Novocain. The Subcommittee on Synthetic Drugs of the National Research Council believes it important that this misunderstanding should be corrected and hence offers the following explanation:

The monohydrochlorid of para-amino-benzoyl-diethyl-amino-ethanol, which was formerly made in Germany by the Farbwerke, vorm. Meister, Lucius and Brünning, Höchst A. M., and sold under the trademarked name "Novocaine," is now manufactured in the United States. Under the provisions of the Trading with the Enemy Act, the Federal Trade Commission has taken over the patent that gave monopoly for the manufacture and sale of the local anesthetic to the German corporation, and has issued licenses to American concerns for the manufacture of the product. This license makes it a condition that the product first introduced under the proprietary name "Novocaine" shall be called Procaine, and that it shall in every way be made the same as the article formerly obtained from Germany. To insure this identity with the German novocain, the Federal Trade Commission has submitted the product of each firm licensed to the A. M. A. Chemical Laboratory to establish its chemical identity and purity, and to the Cornell pharmacologist Dr. R. A. Hatcher, to determine that it was not unduly toxic. . . .

In conclusion: Procaine is identical with the substance first introduced as Novocain. In the interest of rational nomenclature, the first term should be used in prescriptions and scientific contributions.

JULIUS STIEGLITZ, Chicago.

Chairman Subcommittee on Synthetic Drugs, National Research Council.

PATENTS OF INTEREST TO DENTISTS.

- 1185901. Grinding bur, Willard A. Hance, Freeport, Ill.
- 1186330. Tooth brush guard, Arthur E. Peck, Minneapolis, Minn.
- 1186989. Fastening for artificial teeth, James W. Ivory, Philadelphia, Pa.
- 1187079. Tongue depressor, Ephraim R. Miller and R. A. Bowers, Frederick, Md.
- 1187364. Bur-Sterilizer, Edward L. Monnot, Canton, Ohio.
- 1187480. Dental pliers, Edward H. Angle, New London, Conn.
- 1188134. Tool for cleaning teeth, Jose Arbat, New York, N. Y.
- 1187497. Dental instrument, Linnaeus T. Canfield, Toledo, Ohio.
- 1187611. Mouth blowpipe lamp, Frank J. Dawson, Piqua, Ohio.
- 1187520. Artificial tooth and producing the same, Thomas F. Glenn, Ardmore, Pa.
- 1187523. Dental articulator, Rupert Hall, Houston, Texas.
- 1187566. Aseptic container for long-handled broaches, Leila M. Taylor, Salem, Mass.
- 1188614. Tooth-brush, Joseph R. Bowen, Cincinnati, Ohio.
- 1188416. Occlusal plane gage, Wm. C. Dalbey, Duquoin, Ill.
- 1188417. Dental instrument, Wm. C. Dalbey, Duquoin, Ill.
- 1189150. Matrix John McNaughton, London, Ont., Canada.
- 1189164. Artificial tooth, Simon Myerson, Cambridge, Mass.
- 1188823. Tooth-brush attachment, Theodore R. Plank, Los Angeles, Cal.
- 1188845. Toothbrush holder, Godfrey S. Scovell, Toronto, Ont., Canada.

1188708. Tooth, Joe J. Watts, Natchez, Miss.
1189184. Dental drill, Howard A. Whiteside, New York, N. Y.
1189808. Crown-pin for dental work, Hart J. Goslee, Chicago, Ill.
1190152. Dental disk holder, Louis F. Gross, Scranton, Pa.
1190180. Dental pliers, James B. McAllister, St. Johnsville, N. Y.
1189852. Combined comb and tooth brush, Andy J. Melin, Wallace, Idaho.
1189735. Dental injector and extractor, John C. Quintin, Lamanda Park, Cal.
1189505. Tooth brush, Lincoln C. Stockton, Denver, Colo.
1189753. Instrument for making channels for tooth-root pins, Frithjof Thue, Christiania, Norway.
1190057. Attachment for toothbrushes and the like, Robert M. Withycombe, Sydney, New South Wales.
1190340. Package roll of metallic leaf, Ernest H. Swift, Hartford, Conn.
1191556. Toothbrush, Philip W. Blake, Cumberland, Md.
1191659. Dental casting machine, John E. Burns, Flushing, N. Y.
1191586. Artificial tooth, Joseph P. Gomes, New York, N. Y.
1191692. Matching tooth-cement, Garrett L. and F. L. Grier, Milford, Del.
1191637. Mold for making artificial teeth, George H. Whiteley, Jr., York, Pa.
1192298. Toothbrush, Abraham Gerstenzang, New York, N. Y.
1192668. Fountain tooth brush, Edward C. Miles, Oakland, Cal.
1193034. Dental fastening for removable bridges and bridge-plates, Charles W. Lokey, Birmingham, Ala.
1193203. Magazine holder for abrasive disks, Samuel W. Taliaferro, San Francisco, Cal.
1193329. Artificial tooth, Robert M. Withycombe, Sydney, Australia.
49472. Design tooth brush, Charles Dierke, Portland, Oregon.
1193681. Loading dental broaches and needles, Levi L. Funk, Chicago, Ill.
1193682. Machine for wrapping broaches and the like, Levi L. Funk, Chicago, Ill.
1194017. Dental technicon, James P. Harper, St. Louis, Mo.
1193644. Rotary tooth brush, Clarence G. Waudby, Jackson, Mich.
1194540. Tooth brush sterilizer, Vincent C. Quartararo, San Francisco, Cal.
1194436. Dental cabinet, Wesley L. Smith, Pittsburgh, Pa.
1195577. Artificial tooth, Thomas F. Glenn, Ardmore, Pa.
1195465. Dental instrument, Arthur L. Hamilton, Houston, Texas.
1196227. Artificial tooth, Thomas F. Glenn, Ardmore, Pa.
1196582. Cement consistency standard, Paul Poetschke, Kent Co., and F. L. Grier, Milford, Del.
1197174. Tooth brush, Gaylord W. Beebe, Clayton, Ga.
1196959. Combination comb and toothbrush holder, Ernest C. Lewerenz, Utica, Mich.
1196970. Artificial tooth, Simon Myerson, Cambridge, Mass.
1197419. Tooth brush, Otto A. Wilming and J. H. Burke, Willits, Cal.
1197725. Tooth separator, Carl A. Ericsson, Minneapolis, Minn.
1197648. Dental instruments, John H. Meyers, Grand Island, Nebr.
49646. Design, mouth-examining instrument, Philip M. Gayle, Munroe, La.
1198628. Dental broach holder, Alfred R. Ebenreiter, Spokane, Wash.
1198842. Tooth for dental plates, Frank Z. Hanscom, Chicago, Ill.
1198958. Tweezers, Sheridan Risley, Cleveland, Ohio.
1198490. Sanitary holder for tooth brushes, John P. Van Meter, Davenport, Wash.
1198980. Toothpick container, Oscar Weik, Wausau, Wis.
1199647. Dental impression tray, Maurice Ackerman, New York, N. Y.
1199663. Tooth regulator, John E. Canning, Denver, Colo.
1199168. False set, Duncan J. Fisher, Keystone, Mont.
1199268. Tooth brush, Arthur F. Haller, Merrow, Conn.
1199281. Fusing apparatus for dental casting, Lewis H. Lanier, Cordell, Okla.
1199109. Removable artificial denture, Barnabas F. Philbrook, Denison, Iowa.

1199140. Cooled blowpipe or torch, Green B. Wilson, Nevada, Iowa.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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NERVE BLOCKING.*

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Mr. President and members of the Illinois State Dental Society: It gives me a great deal of pleasure to accept your kind invitation to speak to you this evening, and especially upon a subject which is so broad and of such vital interest not only from the dentist's but from the patient's standpoint.

I am a staunch believer and dyed-in-the-wool follower of the methods that eliminate pain from operations. The question of anesthesia is of great magnitude and vital importance to our profession. The careless administration of both local and general anesthetics should be discontinued. Carelessness in the administration of these anesthetics is usually practiced by the dentists having limited knowledge of the physiologic and toxic effect of the agents used.

It is impossible for me in one evening to properly unveil to you this broad subject. I must pass on and try to give you a few of the essential facts.

The word "Anesthesia," meaning "without sensation," was suggested to Dr. Morton by Oliver Wendell Holmes. Anesthesia is a state of insensibility or a state of the loss of sensation produced by artificial means. General anesthesia is covered by this definition but does not cover local anesthesia for the reason that in local anesthesia the sense of touch remains.

There are two ways of producing anesthesia:

*Lecture given before the Illinois State Dental Society, Bloomington, Ill., May 15th, 1918.

First—By rendering the sensory nerve cells and fibers in the brain insensible to pain by general anesthesia.

Second—By blocking the nerve branches at some point after they leave the brain, or by blocking the peripheral nerve endings with a local anesthetic. Local anesthesia may be produced by two meth-



FIG. 1.

This wet anatomical specimen shows head that has been sectioned seven times in order that the relationship of the anatomical structures can be studied.

ods, First, by inhibiting the function of the terminal endings of the peripheral nerves. This renders these terminal nerves within a "circumscribed area" incapable of transmitting painful afferent impulses and is termed "Terminal Anesthesia." Second, by blocking the nerve trunk or trunks at some distant point from the field of operation, the point determined upon may be at any desirable loca-

tion between the peripheral nerve endings and the brain. This is known as "nerve blocking." However, some operators term this "conductive anesthesia."

Nerve blocking anesthesia may be produced by two methods:

First—Perineural.

Second—Endoneural methods.

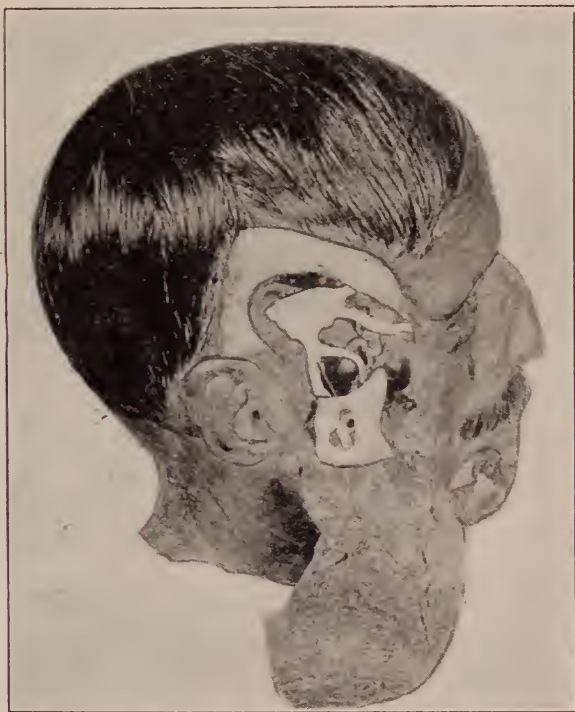


FIG. 2.

Shows specimen which has been carefully prepared in order to show Gasserian Ganglion and the fifth nerve in detail as well as important arteries and other anatomical structures.

In the perineural injections the solution is injected into the tissue near the nerve trunk and the anesthetic solution infiltrates through the perineurium which anesthetizes the neurones.

In the endoneural method, the needle should pierce the nerve sheath and the solution be injected into the nerve trunk proper. This latter method is of very little value and is used only in some cases of major surgery, and it is necessary to make the incision

and expose some large nerve trunk and insert the needle into the nerve at some point above the area of operation, say if the operation is for the removal of a leg or arm, etc.

The perineural method is preferable, however, the same requires a few minutes longer to produce complete anesthesia of the axones. No doubt, the perineural method is better than the endoneural method of puncturing the nerve trunk. It is rather difficult to ascertain whether or not the point of the needle is inserted in the nerve trunk during nerve blocking injections as are given for dental and oral surgery. I have never experienced the slightest difficulty in this respect from neuritis or prolonged anesthesia.

The specialist or practitioner taking up the various forms of anesthesia and more especially nerve blocking, must appreciate that it involves many important details and each step is a well defined and separate feature, and that neglect or oversight in any of the details may produce unsatisfactory results.

The following should be established in order to obtain the best results.

First—Strict adherence to asepsis.

Second—A true knowledge of the anatomical parts.

Third—Carefully selected equipment.

Fourth—The use of an isotonic anesthetic solution composed of ingredients corresponding to the physical laws of osmotic pressure and functions of the living cells.

Fifth—Thorough familiarity with all phases of the technique.

Sixth—Judicious selection of the correct method to be employed in each individual case.

Seventh—Diagnosis of any and all existing conditions.

Local and general anesthesia in their various forms are invaluable in oral surgery and modern dental practice and it behooves the dentist to familiarize himself with those agents and methods for the purpose of eliminating pain if he expects to keep pace with the modern trend.

I am quite aware of the fact that it is not necessary to use a local or general anesthetic in every case, but I am a firm believer in some pain relieving agent in those cases in which it is indicated, and I am quite sure the patients upon whom they are employed to have an operation performed, will speak words of praise and gratitude for the dentist who renders them such service. We must view

the subject of anesthesia from a broad standpoint, and it is self evident when this important subject is handled with this aim in view, that the members of the profession will profit much more than would be rendered to one particular phase of anesthesia. One of the foremost subjects today in both dental and medical science is that of

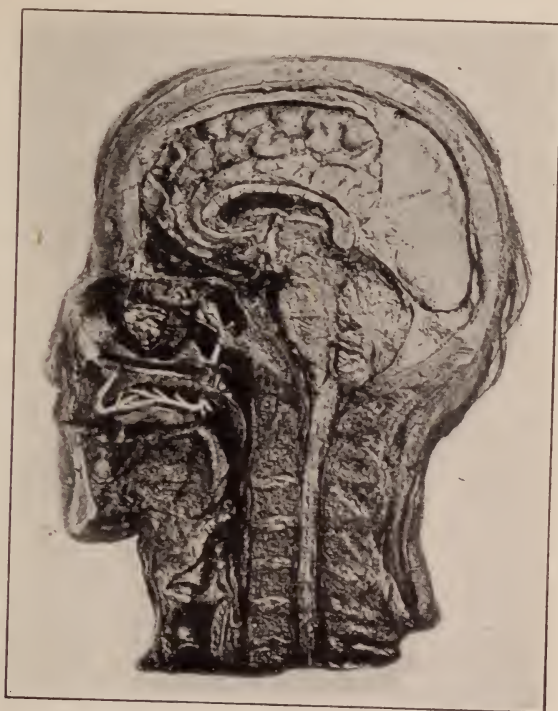


FIG. 3.

Above wet specimen was sectioned through the median line. Note the inner nerve loop which is formed by the naso-palatine and anterior palatine nerves. The anterior palatine nerve is exposed in posterior part of middle meatus. A portion of tissue was removed from beneath the frontal lobes of the brain due to the presence of a tumor which can be seen in the nasal cavity. The circle represents the outline of tissue which was located above the ethmoid bone.

anesthetics. It is gratifying to go back over the records and note the advancement that has been made, and the most rapid advancement has been during the past twenty-five years, and it has evolved itself into a distinct science. Various methods and agents have been introduced as a means of annulling the pain of surgical and dental operations, and all these agents no doubt have some merit but some

are superior to others. Whatever method or methods one undertakes to employ, it must be pursued with diligent and persistent effort to become proficient in its use. There are two methods which stand supreme today, one being local anesthesia, under which are many divisions and sub-divisions such as nerve blocking, intra-osseous, and terminal anesthesia; and the other is general anesthesia, and here we mention nitrous oxid and oxygen as the most efficient anesthetic aid known in the hands of the experienced and a dangerous anesthetic in the hands of the novice, for prolonged surgical operations. Nitrous oxid and oxygen stand supreme as a general anesthetic when it is administered by one skilled in its use, and the pathological effects upon the patient are practically nil. It is a point not to be argued that nerve blocking in all its phases, when skillfully employed is of greater value to the dental and oral surgeon than is general anesthesia. General anesthesia has its place in dentistry and has its indications and contra-indications in certain individuals, which is also true for nerve blocking. In a high percentage of cases for operative dentistry and oral surgery, nerve blocking in some of its phases is preferable to general anesthesia. Nerve blocking is adapted to those parts where the nerve trunks are readily reached by the needle. The key note to success is to practice asepsis, a thorough knowledge of anatomy, and to deposit the solution near the nerve trunk supplying the area of operation—then it is imperative to have an accurate knowledge of the muscles and attachments, osteology, nerves, blood vessels and their anastomoses and other anatomical structures.

When one masters the technique of nerve blocking any or all parts of the jaws or any other regions of the head can be easily blocked; the patient being conscious can prevent the inspiration of mucous or blood and thus assist the operator with the operation. Nerve blocking is used with great satisfaction in oral surgery and operative dentistry for exodontia, removal of certain tumors, reduction of fractures, antrum operations, treatment of tic douloureux, apicoectomy, alveolotomy, pulp removal, cavity preparation, peridontia and crown and bridge operations.

By no means is nerve blocking limited to surgery of the head, but is being employed by many surgeons with satisfaction for the following operations: Hernia, appendicitis, empyemia, gastrostomy, tracheotomy, goiter, rib resection, inguinal colostomy, various am-

putations, varicocele, hydrocele, circumcision, ligation of arteries, removal of subcutaneous tumors and other general surgical operations.

The impacted third molar can be removed under nerve blocking with the co-operation of the patient and anesthesia will last in accordance with the amount of the vaso-constricting agent used in the injecting solution (five minutes to two hours) thus giving ample time for this or any other operation with a minimum amount of laceration. Complete apposition of the bones in case of fracture can be secured and splints can be adjusted with the co-operation of the patient and with absence of pain.

REACHING THE GOAL OF A SHOCKLESS OPERATION

It is the aim of every modern surgeon to employ technique which produces the least amount of shock to his patient, and within recent years more and more attention is being paid to the anesthetic and the capability of the anesthetist. It is quite true that in years gone by the little attention given the anesthetic agent employed, and the haphazard manner in which it was administered, caused the surgeon a great deal of grief with many of his cases; but now the anesthetist and surgeon can in many cases predict the outcome of the case after a thorough physical examination.

In years gone by it was the custom to select only one general anesthetic in surgery, but modern research has proved that in order to attain the desired goal of a shockless operation it is far better to select a combination of methods, and follow a definite technique in order to reach the highest ideal. We must acknowledge as a fact that the dental practitioner is confronted many times with operations which cause pain and this factor has acted as a stumbling block in rendering the best service, and does in many instances create in the mind of the patient a horror of the treatment that is so necessary for the proper maintenance of health. In this day and age of anesthetics there is no more reason why a dentist should inflict pain while rendering service than a surgeon in amputating a leg. However, it is not in all cases the amount of pain really inflicted that causes emotional shock or collapse, but in many such results can be attributed to the fear of being hurt. The clinical and laboratory research on shockless operations, accomplished by Dr. Crile of Cleveland is really a revelation, and his clinical records prove the value of well selected methods. He says: "The word anesthesia—

meaning 'without feeling'—describes accurately the effect of inhalation anesthetics. Although no pain is felt in operations under inhalation anesthesia, the nerve impulses, set up by surgical operations, reach the brain. These are the afferent impulses which cause pathological brain changes. In this manner traumatic shock is caused. How can we prevent it? On the kinetic theory, no shock could be produced by traumatizing a territory whose nerve connection with the brain has been broken by nerve blocking. By blocking nerve connections, local anesthetics protect the brain against destructive stimulation of the brain cells. Each anesthetic covers a part of the field, but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. The patient's fear of the operating room, unsoothing words, and the dread of the operation and the taking of an anesthetic, the rough manipulation of the tissues during the operation, and the ungentle post-operative manipulation, all these things generate harmful stimuli which are sent to the brain and cause detrimental effects, the stored up energy in the normal brain cells being destroyed."

These harmful stimuli, which in the past have played an important role in causing a high mortality rate, are now blocked by the anoci-association method and in consequence there is a decrease in the mortality rate to an extent one can hardly believe. This new principle excludes all harmful stimuli reaching the brain and the bad risk patient has a greater chance to live than the patient who is operated without the blocking of these impulses. This is accomplished in modern surgery as follows:

- (1) By exclusion of fear and dread of the operation.
- (2) By the administration of morphine and scopolamin one hour before the operation.
- (3) By the scientific administration of N_2O & O .
- (4) By nerve blocking.
- (5) Careful post-operative treatment.

Dr. Crile also makes the following statement: "No matter how extensive the operation, no matter how sick the patient, no matter what part is involved, if anoci technique is perfectly carried out the pulse rate at the end of the operation is the same as at the beginning, and the post-operative rise of temperature, the acceleration of respiration, the pain, the nausea, and the distention are minimized or wholly prevented." Is it not just as important that the dental prac-

itioner should endeavor to eliminate detrimental factors from his operations as for the modern surgeon? It is true that the operations performed by the dentist are not so grave in character as those of general surgery, yet they are just as important, and the patient appreciates the accomplishment of dental service free from pain. How is it possible to avoid the dread, the fear, and the pain caused by dental operations? It can be accomplished through the medium and proper application of proper pre-operative environment; a prelimi-



FIG. 4.

This specimen has been prepared in order to show important structures for oral surgery operations. The inferior dental and lingual nerves can be seen.

nary sedative if necessary: Procaine-Suprarenin-Ringer solution; Nitrous Oxid-Oxygen; careful operative procedures; proper application of psycho-therapy and efficient post-operative treatment.

NERVE BLOCKING IN ORAL SURGERY

This important branch of anesthesia has made such rapid strides within the last two years it has attracted the attention of the oral surgeon as well as the general practitioner of dentistry, and in many operations the oral surgeon is now able to obtain results heretofore unattainable through the medium of general anesthesia. It is a well-known fact that many times the oral surgeon is handicapped

while operating for various pathological conditions of the jaws or within the oral cavity when a general anesthetic is employed.

The head and neck offer an available field for operations under nerve blocking. This is especially true of operations involving the face and jaws from the very fact of the constant location and susceptibility of the nerve trunks supplying these parts. The modern trend has been in the direction of blocking the deep nerve trunks and this technique has made possible many major operations which were heretofore performed only under a general anesthetic. It goes without saying that nerve blocking should only be employed in cases where it is possible to completely block the operated area and render it insensible to pain.

Nerve blocking is technical and demands skillful technic in its employment in order to attain satisfactory results for both the operator and the patient. Considerable skill is required in making deep nerve-blocking injections, and every one must expect failures at the beginning.

The operator should blame failure to the technic used and should search diligently for the cause of failure to render the parts insensible to pain. The trained anesthetist can make a most valuable use of psycho-therapy in addition to his general anesthetic, and this is of exceptional value to the operator employing local anesthesia in its different branches. The imperfection of the technic often leads the operator to persuade his patient and he himself labors under the delusion that no pain is experienced. When the operation is upon a patient, who is hysterical and of nervous temperament, and anticipation and fear of pain are added to the adverse conditions which go to make up the failure, the patient may actually cry out and manifest a high degree of excitement during the operation and afterward tell the operator that she felt no pain. This type of patient should never be given a local anesthetic, but a general anesthetic should be employed, because the dread of the operation and the fear of being hurt is as wearing upon the nervous system as is the actual pain. In every case requiring an anesthetic we should use our best judgment in deciding which to use—a local or a general anesthetic. The nature of the operation and the physical condition of the patient should both be taken into consideration in the selection of the anesthetic. The anesthetist must not be hasty in his decision.

Extremely gratifying results are obtained from nerve blocking when the technique is properly executed. It is not possible to secure one hundred percent success in all cases, neither can we secure this result with the use of nitrous-oxide-oxygen, ether, chloroform, or any other anesthetic agents. The skilled and experienced anesthetist never realizes a complete success in each and every case, with any anesthetic, but it is evident that we can obtain better and more gratifying results through the careful selection of the anesthetic agent or agents most adaptable to each case.

ANATOMY.

The latest key note to success with nerve blocking is for the operator to have a thorough knowledge of the anatomical parts. This is absolutely imperative if the operator expects to make the deep nerve blocking injections in an intelligent manner, because we will all agree that to insert a needle into the deep tissues at random and not knowing the exact location of the various nerve branches to be blocked, would result in failure many times. When the operator is familiar with his anatomy, knowing the exact position of all anatomical structures, and their relationship to each other, the needle can be inserted with more accuracy and in most cases we can predict the outcome will be a success.

It is impossible for me this evening to discuss the anatomy that is so necessary for the operator to know, therefore I refer you to any standard textbook and the dissecting room.

ANATOMICAL SPECIMENS

Too much emphasis cannot be placed upon the value of properly prepared wet anatomical specimens for those operators who are desirous of becoming familiar with the anatomical structures and their relation to oral and dental surgery and for nerve blocking injections. The student and post-graduate can obtain more practical knowledge from a few hours' conscientious study of carefully prepared specimens or in the preparation of these specimens, than to spend days perusing books on anatomy. It has been my pleasure to prepare a large number of specimens, which have proved of immeasurable value in the execution of my work, and to members of the profession who have studied them in study clubs. These specimens were carefully prepared and surgically embalmed, and were then sectioned at various levels showing the different nerves and

branches, ganglia, arteries and veins, and bony land marks. They show all anatomical land marks in their relationship to each other which come under the operative field of the oral surgeon as well as the eye, ear, nose and throat specialist. Within the near future, it is my intention to prepare several more specimens and the anatomy of the tonsils, throat, ear, nose, antrum, frontal sinus and mastoid, will be carefully worked out in detail.

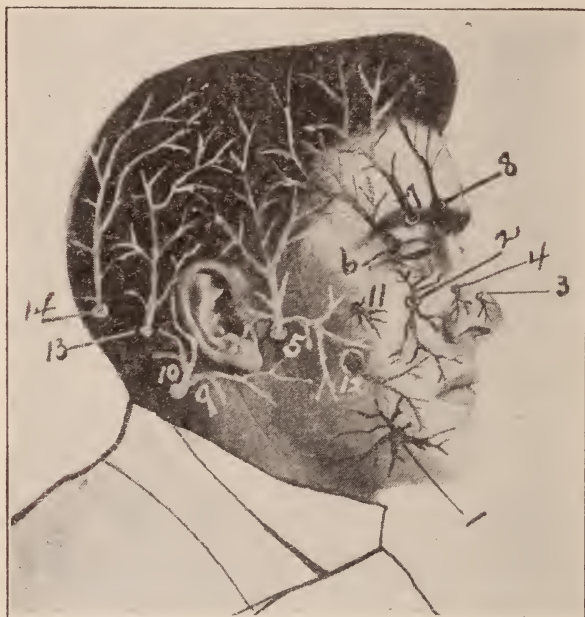


FIG. 5.

This photo shows the sensory nerves supplying the face which branches can be blocked for oral and plastic surgical operations.

I will take pleasure in showing you the photographs of a number of them with the stereopticon this evening. However, I will at this time refer to one specimen in a concise manner.

The head was sectioned through the median line, and an incision made from the external angular process of the frontal bone to a point 3 cm. above the pterion, then to a point anterior to the anti-tragus, extending downward to a point midway between the sigmoid notch and the angle of the mandible. After making this incision a flap of skin and muscle was carefully separated from the periosteum

over portions of the following bones, temporal, parietal, sphenoid, maxillary, malar and ramus of the mandible. Portions of these bones were trephined away and portions of the temporal and frontal lobes of the brain removed, exposing the following structures: Gasserian ganglion, posterior, middle, anterior and naso-palatine, inferior dental and lingual nerves, internal maxillary artery and several of its branches. The superficial origin of the fifth cranial nerve is at the side of the pons varolii and is shown connecting with the Gasserian ganglion. The fifth nerve and all its branches are carefully exposed to their termination. The various foramina, such as the infra-orbital, mental, anterior palatine, posterior palatine, posterior superior alveolar, inferior dental, show the nerve trunks as they pass through them. It is very instructive for the operator taking up this work to practice placing the needle in the various regions for making injections. In this way he will become familiar with the depth and direction of the needle for blocking the nerve trunks. Many hours are required to properly prepare specimens but one is amply repaid for the careful dissection required to properly prepare them.

As above stated, too much emphasis cannot be placed upon the value obtained from dissections of this character and to emphasize this fact, I will call your attention to the following quotation, taking from an address of the eminent surgeon—the late Dr. John B. Murphy:

“When taking a new step in medical procedure, you have much more to think of than your own career. Your most careful thought must be for the patient. If you perform a new operation, do not do it for the first time on the patient. Do it on the cadaver and on the dog. May I add here a few words to aid you in the development of your surgical technique? If I had to state where I acquired the greatest amount of technical knowledge, where I received the greatest benefit in the way of gaining confidence in my own operative procedures, I should say that practically all of it was acquired from operations on the dog and from operations on the cadaver.”

ADVANTAGES OF NERVE BLOCKING ANESTHESIA

1st—Freedom from general anesthetic accidents, blood changes and anesthetic discomforts in most cases.

2nd—Duration of anesthesia may be changed according to the various amounts of the vaso-constricting agent used in the injecting

solution. The long duration of anesthesia is of great value to the operator for the removal of impacted third molars, draining the antrum, apicoectomy, alveolotomy, removal of tumors and cysts, resection of the jaw, curettement of necrosed bone, plastic operations, tonsillectomy and many other operations which come under the observation of the oral surgeon.

3rd—The long duration of anesthesia permits the operator to

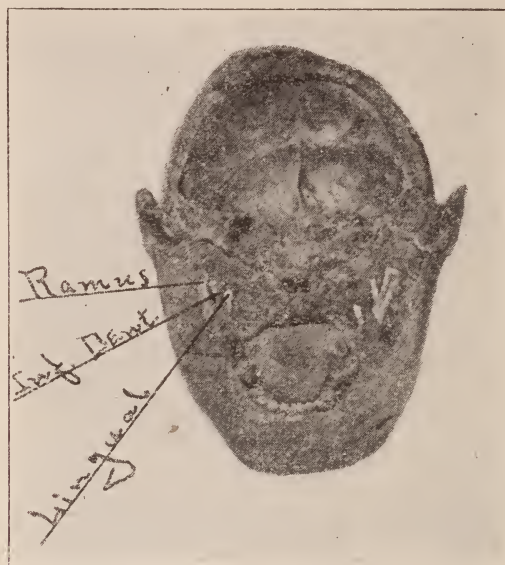


FIG. 6.

Horizontal section of wet anatomical specimen incised at a point 1 cm. above the occlusal plane of the lower teeth. The lingual and inferior dental nerves are fully exposed.

take his time with the operation which gives him an opportunity to employ his skill while operating.

4th—Large or small areas may be anesthetized, depending upon the nerve or nerve branches to be blocked.

5th—One or two insertions of the needle will block an operative field, depending upon the nature of the operation and the area to be blocked.

6th—Anesthesia is secured over infected or inflamed areas by blocking the nerve branch and healthy tissue at a distant point from the operative field.

7th—Nerve blocking injections, when successfully made, are without pain to the patient because the needle is inserted into the mucous membrane and loose connective tissue.

8th—Cooperation of the patient—it is well known that this is of material advantage to the operator, because he can operate with ease and complete the operation with a minimum amount of laceration and without the inspiration of blood and mucus.

DISADVANTAGES OF NERVE BLOCKING

1st—The disadvantage of local anesthesia is the patient's knowledge of what is taking place. This can be overcome in nearly every case if the anesthetist is tactful, masterful and assuring. If the patient is very nervous, a general anesthetic should be employed if the nature of the operation warrants its use.

2nd—When the tissue is highly inflamed, and the oral cavity is extremely septic, containing pus, it would be bad practice to make intra-oral injections and then the extra-oral injections should be employed such as the blocking of the second and third divisions of the fifth nerve.

3rd—In certain cases of oral surgery which have caused a great deal of inflammation to distant parts, such as the muscles of mastication and temporo-mandibular joint, even if the terminal branches of the fifth nerve are blocked, the patient would in many cases experience pain from distant regions during the manipulation of the tissues during the operation for the very reason those parts have not been blocked. In such cases it would be far better to make extra-oral blockings so that these parts would be anesthetized or employ general anesthesia.

4th—In certain pathological conditions, such as emphysema, arterio-sclerosis, myocarditis, and other pathological conditions wherein a high blood pressure is contra-indicated, it would not be advisable to inject a large quantity of local anesthetic solution containing a high percentage of the vaso-constricting agent in view of the fact that its action produces rise of blood pressure.

LOCAL ANESTHESIA CLASSIFICATION

It is impossible for me tonight to go into the detailed technique of all the various nerve blocking injections of head and neck. However, I have the stereopticon slides with me and if time will permit I will run them through as quickly as possible and give a brief synopsis of various injections.

I will now endeavor to give the classification of nerve blocking enumerating the various divisions and sub-divisions, and mention the nerve branches which are blocked.

CLASSIFICATION

Nerve Blocking:



FIG. 7.

This wet specimen was carefully prepared to show important anatomical structures which are valuable to the oral and dental surgeon. The tissues of this specimen are almost as soft and pliable as during life.

Peri-neural.—Extra-Oral and Intra-Oral—See below.

Endo-neural.

Regional.

Intra-osseous (missing link).

Terminal, infiltration or peripheral.

Schleich infiltration.

Peridental.

Sub-mucous.

Sub-periosteal.

Pressure.

High pressure.

Spinal anesthesia.

Refrigeration.

Nerve Blocking :

Intra-Oral Blocking for :

Second divisions of Trigemini.

Inferior dental-lingual.

Mental.

Incisive.

Lingual.

Posterior-superior alveolar.

Middle-superior alveolar.

Anterior-superior alveolar.

Infra-orbital.

Naso-palatine.

Anterior palatine.

Middle palatine.

Posterior palatine.

Tonsillar plexus and Pharyngeal plexus.

Extra-Oral Blocking for :

Gasserian ganglion.

Ophthalmic division of 5th nerve.

Superior Maxillary division of 5th nerve.

Inferior Maxillary division of 5th nerve.

Infra-orbital.

Frontal

Supra-orbital.

Lachrymal.

Anterior-superior alveolar.

Inferior dental-lingual.

Posterior-superior alveolar.

Cervical plexus.

Nerve Blocking for :

Tonsillectomy.

Nerves blocked :

Tonsillar plexus.
Pharyngeal.
Plexus.
Anterior palatine.
Middle palatine.
Posterior palatine.

Nerve Blocking for:

Head and neck surgery.
Plastic surgery.
General surgery.
Oral surgery.

By the perineural method of nerve blocking, the solution is injected into the neighborhood of the nerve trunk supplying the operative field and the solution reaches the nerve by diffusion, while with the endo-neural method, the needle point is inserted into the nerve direct and the solution injected. The latter method has practically no value in the production of anesthesia for oral surgery. We are aware of the fact that the finest branches of the terminal nerves are covered only by a very thin sheath and this sheath increases in thickness as it passes toward the brain. It is evident that the smaller the nerve the more readily an anesthetizing solution will reach the fibers surrounded by the nerve sheath thus blocking painful impulses. Now it can be said that the larger the nerve trunk and the thicker the nerve sheath, a longer period of time must be allowed for the solution to produce complete anesthesia for that particular nerve trunk. Some operators overlook this particular phase of technique in not allowing sufficient time to elapse between the time of injection and the time for operation. For the terminal anesthesia method the solution is injected into a circumscribed area and the solution comes in contact with the fine terminal endings and their sensory end organs. The area of operation is infiltrated and has its drawbacks in many operations. It is highly gratifying when the members of the medical and dental professions realize that the birth-place of both general and local anesthesia was in the United States and was principally developed by American surgeons, dentists and anesthetists.

The first advocate of deep injections was the American Corning who introduced it to the profession in 1887. To Dr. George B. Crile, of Lakeside Hospital, Cleveland, Ohio, belongs the credit of

first employing nerve blocking by the direct intraneural method in major operations and reported the first case before the Ohio State Medical Society. The operation was for the amputation of a leg under nerve blocking, LATER FOLLOWED BY PROF. MATAS OF NEW ORLEANS. Following this Braun called the method "conduction anesthesia," and has contributed wonderfully to this subject. Worthy mention must also be made of the good work of Allen, Hertzler, Crile on anoci-association, Fisher, Puterbaugh, Neiman, Potts, Prinz, Schultz, Lyon, Thoma, Blum, Berger, and Silverman. These men have contributed wonderfully to this important link in anesthesia and their findings have proven of great value to the members of our profession. It appears to me that the term "nerve-blocking" is superior to the term "conduction."

TIME TO WAIT FOR ANESTHESIA

The time required to wait for anesthesia following the injections, depends upon these factors:

- 1st—Percentage and amount of anesthetizing solution injected.
- 2nd—Diameter of nerve trunk and thickness of the nerve sheath.
- 3rd—The skill of the operator in depositing the solution in the right location. It is self evident if the solution is not injected near the nerve trunk, good anesthesia will not be secured. The operator must bear in mind the required time to wait for anesthesia, and not be too hasty beginning the operation before complete anesthesia has intervened.

It might be stated here in a general way, that the time to wait following the injections of solution into the various nerve trunks, supplying the operative field of the oral surgeon and dentist, is from one-half minute to fifteen minutes, depending upon the size of the nerve or nerve trunks which have been blocked.

TECHNIQUE

It is impossible, as stated before, to cover the detailed technique of all injections in this short time. In all we have something like thirty injections for operations within the oral cavity, jaws, face, head and neck, and I will attempt only to partially cover some of the most important ones.

BLOCKING THE POSTERIOR SUPERIOR ALVEOLAR NERVE

This can also be termed Tuberosity Injection.

After the tissues in the region of the installation of the needle

have been thoroughly prepared by cleansing, drying and receiving the proper antiseptic solution, the following technique is applied:

The patient's mouth is about one-half open. With the fingers of one hand to pull the cheek laterally so as to expose the area of injection, insert the needle into the mucous membrane at a point where the tissue of the cheek blends with that of the gum tissue.

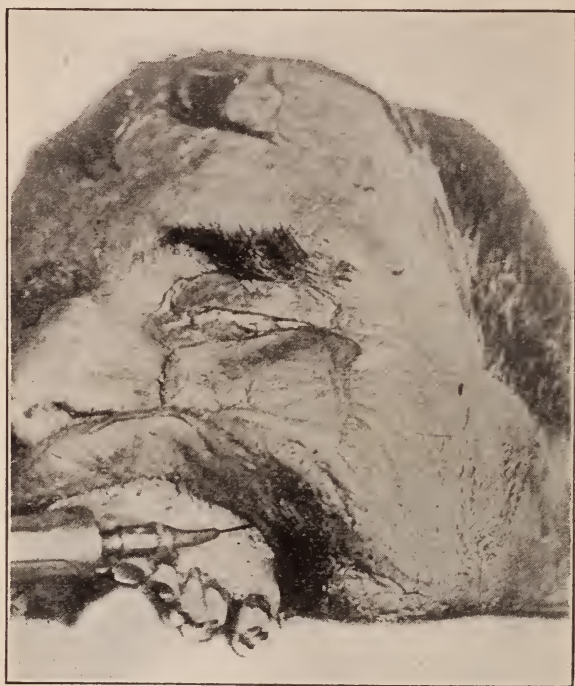


FIG. 8.

The above wet specimen shows the needle in correct position while injecting the solution for the posterior superior alveolar nerve. A special needle with curved hub is used.

The needle is inserted $\frac{1}{2}$ cm. above the apex of the disto-buccal root of the upper second molar. The needle employed is 3 cm. in length and 24 gauge. It has an extension of hub and is slightly curved which assists the operator in forcing the needle around the posterior lateral curvature of the superior maxillary bone. It must be borne in mind that the posterior superior alveolar foramen is located at a point 2 cm. above the disto-gingival margin of the upper third molar. This foramen being located around the curvature of the superior

maxillary bone, it will be found that it can be reached much easier. when the needle, which is contained in a slightly curved hub, is employed. It is true that a smaller needle can be used successfully for this injection, but it is necessary to hold the syringe laterally, much more then it is necessary to stretch the patient's cheek in order to force the needle around the curvature of bone, and then it is impossible for the point of the needle to reach the posterior superior alveolar nerve, as it passes into the foramen of the same name.



FIG. 9.

Correct position of needle when the point is resting near the posterior superior alveolar foramen. Needle with slightly curved hub is employed.

After the needle punctures the mucous membrane, it is carried upward, backward, inward to a depth of 1 cm. When the depth has been reached the syringe is carried laterally working it back and forth slightly until the point of the needle strikes the periosteum covering the posterior lateral curvature of the superior maxillary bone. By striking the periosteum it proves that the needle is in contact with same and if this is accomplished the needle is forced upward and backward directing it at a point 1 cm. above the roots of the third molar until another cm. of the needle has disappeared. The needle should now be in the tissue to an approximate depth of 2 cm. and by the needle being 3 cm. in length, there will be 1 cm. remaining on the outside.

In other words, the needle is inserted to the gold plate mark.

The needle is carried around the tuberosity in contact with the periosteum and by using a needle as described it is an easy matter to reach the immediate region of the nerve trunk to be blocked and excellent results will be obtained following the injection.

I am quite aware of the fact that the location of various nerves will vary, but if the needle is started in the tissue, as above stated



FIG. 10.
Tuberosity injection. Note position of syringe for blocking posterior superior alveolar nerve.

and is carried in the direction as given and to the depth of 2 cm., good results must be obtained.

Two cubic centimeters of the anesthetic solution is injected slowly and anesthesia will be obtained in the upper second and third molars, alveolar plate of bone, periosteum, gum tissue, and mucous membrane on the buccal side in from three to ten minutes following the injection. A point which must not be forgotten is that the posterior superior alveolar nerve anastomoses with the middle superior alveolar nerve at a point above the upper second bicuspid and first molar teeth. The upper first molar tooth is the dividing line be-

tween this injection and the one made anterior. It is not possible, only in some cases, to obtain anesthesia of the upper first molar following the tuberosity injection, due to the fact that pain would be transmitted over the middle superior nerve which has not been blocked. The dental plexus which is formed from the branches of the posterior middle and anterior superior alveolar nerves is quite



FIG. 11.

Position of specially constructed needle on the skull to show position for blocking the second division of fifth nerve by the intra-oral method.

a complex arrangement of nerve fibers, and in order to block the area of the two superior bicuspid and the first molar it is necessary to make another nerve blocking injection. This area, as above stated, is supplied by the middle superior alveolar nerve and is one of the few nerve branches which cannot be reached by the needle due to the fact that it is located beneath the bone. That is in the outer wall of the antrum of Highmore. Personally I block this area by using the method of intra-osseous anesthesia which I have worked

out within the past few months and will explain in detail later on.
BLOCKING THE SECOND DIVISION OF THE FIFTH NERVE—INTRA-ORAL
METHOD.

The writer worked out the technique for this particular injection some months ago and used it in a large number of cases with satisfaction. This injection, with several others, was carefully worked



FIG. 12.

Note position of hub of needle while needle is resting in proper location for blocking the second division of the fifth nerve by the intra-oral method.

out on the cadaver and they promise to be of exceptional value not only to the oral surgeon, but also to the eye, ear, nose and throat specialist as well. The blocking of this large nerve trunk is an easy matter provided the operator is thoroughly acquainted with its technic. The maxillary or second division of the fifth nerve passes from the brain through the foramen rotundum and crosses the speno-maxillary fossa entering the floor of the orbit. At this level the speno-maxillary fossa, from the foramen rotundum to the pos-

terior part of the orbit is, in the average case, from 7 to 10 mm. in width. The needle is inserted into the region of the second division posterior to the floor of the orbit and the solution injected. The technique for this injection is as follows: Use a needle 36 mm. long, 24 gauge, attached to an extension hub having a certain curvature. The mucous membrane is punctured by the needle in the fold where the cheek blends with the gum tissue at a point superior and lateral



FIG. 13.

Note the needle resting along the posterior lateral curvature of the superior maxillary bone. This is the correct position for blocking the second division of the fifth nerve.

to the upper third molar. The needle is now directed upward and inward keeping it in contact with the periosteum covering the posterior lateral curvature of the tuberosity of the superior maxillary bone. This route is devoid of arteries and veins. The depth of the needle is approximately 3 cm. in the average adult case. The amount of solution used is 3 cc. Time to wait for anesthesia is from 5 to 15 minutes. Anesthesia is secured in all the parts which are supplied by the second division of the fifth cranial nerve. The following operations can be performed: Resection of the superior maxillary, extraction of teeth, reduction of a fracture, amputation of roots of teeth,

establishment of drainage or curettement of the antrum and nasal operations. If the opposite side is blocked operations near and involving the medium line as well as on the opposite maxillary bone can be performed, including operations for hare-lip and plastic operations.

MANDIBULAR-LINGUAL ANESTHESIA

Blocking the Inferior Dental and Lingual Nerves—Intra-Oral Method.

Have the patient open her mouth as wide as possible, place your index finger against the ascending ramus allowing the palm of the finger to rest upon the occlusal surface of the lower teeth. Great care should be exercised to not mistake the dense connective tissue, which covers the anterior surface of the masseter muscle in some cases, for the ascending ramus. This can be overcome by having the patient open and close the mouth slightly, and should the index finger rest against the anterior surface of the masseter muscle it will be found that resistance will vary, whereas, if the tip of the index finger rests against the ascending ramus the resistance will remain the same. Next locate the external and internal oblique lines and the trigonum retromolare with the dorsal surface of the finger toward the median line. Allow the radial side of the index finger to rest upon the occlusal plane of the lower teeth. Now retract the mucous membrane beneath the finger to give ample room for the needle to pass the end of the finger nail. Now force the needle through mucous membrane, striking the inner oblique line. The width of the average index finger is 2 cm. and when the mucous membrane is punctured at the middle of the finger nail, it makes an excellent guide in puncturing the mucous membrane in this location. The distance from the puncture of the mucous membrane to the periosteum covering the inner oblique line is about 5 mm. Allow the barrel of the syringe to rest over the bicuspid on the opposite side of the mouth. Be careful to keep the needle a distance of 10 mm. from the occlusal plane of the lower teeth. When the internal oblique line is reached with the needle, cross the median line to a point outside the arch on same side of injection. Be very careful not to allow the point of the needle to go beneath the periosteum. When the syringe is on the outside of the arch on same side of injection insert needle posteriorly about 5 mm. and inject $\frac{1}{2}$ cc. of the solution so as to anesthetize the lingual nerve. The lingual nerve is located 5

to 7 mm. from the inner surface of the ascending ramus. Now bring the syringe back across the median line, this distance being governed by the amount of divergence of the two rami. Now insert the

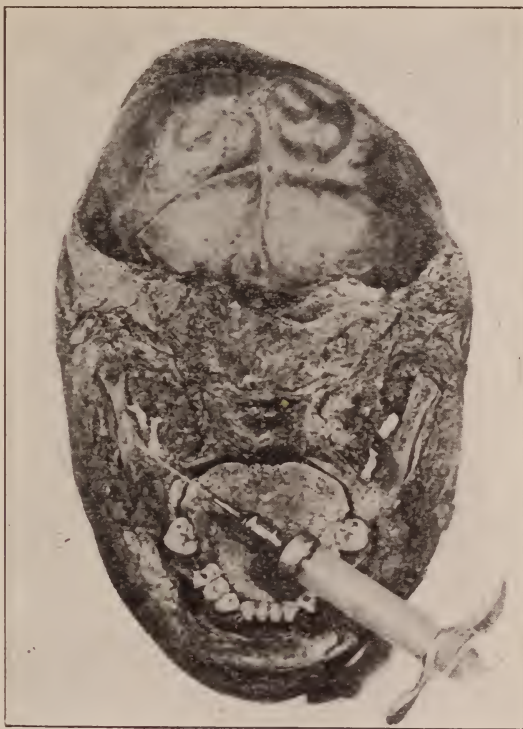


FIG. 14.

Horizontal section of a specially prepared specimen. The incision extended from the angle of the mouth 1 cm. above the parallel to the occlusal plane of the lower teeth posteriorly through the base of the brain. This section shows the hypodermic syringe and needle in the first position for blocking the inferior dental and lingual nerves. The point of the needle is resting against the periosteum covering the inner oblique line of the Ascending Ramus. Note the needle is parallel with and one centimeter above the occlusal plane of the lower teeth.

needle 10 mm. to reach the inferior dental nerve. If the syringe has been held in the proper position the point of the needle will reach the periosteum at an acute angle to the inner surface of the ascending ramus in the region of inferior dental foramen when at a depth of approximately 20 mm. Before injecting the solution into the mandibular fossa, it is well to work the syringe back and forth one

or two millimeters and inject the solution only when the point of the needle rests against the periosteum.

Inject $1\frac{1}{2}$ to 2 cc. of this solution for the inferior dental nerve. It is necessary, for best results, to work the syringe back and forth slightly at the time the solution is being discharged, in order to as-



FIG. 15.

This illustrates the second position of the syringe. It is carried across the median line from its original position to a point outside of the arch on the same side of the injection. The needle point is resting against the Lingual Nerve which is located at the depth of ten millimeters in most cases.

sist the tissue in absorbing the solution and not to cause a too rapid distension of the soft parts. The amount of solution used for inferior dental and lingual nerves in the average case is $2\frac{1}{2}$ c. c. If the operator is skillful in his technic, operations can be begun, in some cases, within five minutes after the injection. The needle used for this injection is 30 mm. long and 24 gauge, made of iridio-platinum. Anesthesia will be secured in the greater part of the lower jaw.

The producing of anesthesia near the median line depends upon how rich the nerve supply is in this particular region between the inferior dental and lingual nerves on the injected side and their fellow nerves on opposite side. Following the blocking of the inferior dental-lingual nerves on both the right and left sides of the mandible,



FIG. 16.

The syringe is now carried across the median line in the region of the Cuspid Tooth. The needle point is resting against periosteum near Inferior Dental Foramen forming an acute angle with the surface of Ramus. Depth in most individuals is two centimeters.

anesthesia is produced in the lower jaw in the greater percentage of cases. In a small percentage of cases the blocking of these various nerve trunks on both sides does not render insensible to pain the tissue in the region of the median line labial to lower incisors, because the cervical plexus in a few cases supplies this particular region with nerve branches. When this is found to be the case, the incisive nerve-blocking injection is made by inserting the needle at

the side of the median fold of mucous membrane and forcing the needle into the base of the left incisor fossa, then retract the needle without taking it out of the tissue, and force it down into the right fossa and inject the solution. Deposit 1 c. c. in each fossa. The blocking of these nerves should be sufficient to enable the operator to extract all of the teeth, reduce a fracture, remove necrosed bone, remove pulps from the teeth, or remove a cyst or tumor either in the region of the mandible or from the soft tissues in the floor of the mouth.



FIG. 17.

Horizontal section of a wet anatomical specimen showing exposed Mental Nerve. Needle is in contact with periosteum only at Foramen.

MENTAL ANESTHESIA.

The mental foramen is located midway between the lower border and alveolar border of the lower jaw, and in fifty percent of the cases below and between the apices of the roots of the two lower bicuspid. In twenty-five percent of the cases a slight distance anterior to this point, and in twenty-five percent of the cases a short distance posterior to this point. Stand behind your patient, locate the mental foramen with the index finger by palpation or pressure. When direct pressure is brought to bear over the mental nerve, as it emerges from the mental foramen, the patient will experience pain

due to the fact that the mental nerve rests upon the sharp margin of the anterior portion of the mental foramen. Depress the lip with your thumb and insert the needle into the mucous membrane at a point where the cheek blends with the gum tissue, just buccal to the



FIG. 18.

This illustration shows the correct position of hands and syringe while blocking the Mental and Incisive Branches of the Inferior Dental Nerve. The needle is directed downward and inward to a depth of one centimeter, at which point the needle should be at opening of the Mental Foramen.

second bicuspid. Direct the needle downward and inward pointing it toward the foramen. Insert the needle approximately 10 mm. Strike the periosteum only at a depth as above given and the point of needle should be near the foramen. Care should be taken not to allow the point of the needle to come in contact with the periosteum before the region of the foramen is reached, from the fact that the surface of the bone at this point contra-indicates following same with the

needle. Inject two c. c. of the solution. Massage the skin over the area forcing the solution through the foramen thus anesthetizing the incisive nerve in the inferior dental canal which is a continuation of the inferior dental nerve. You will secure anesthesia of the two bicuspsids and in some cases the cuspid. This injection is sufficient



FIG. 19.

This photograph shows the needle point resting in the Left Incisive Fossa for blocking the Left Incisive Nerve. Needle enters tissue between and below roots of Central Incisors in the median line. If opposite side is to be blocked, retract needle and force into right fossa without taking needle out of tissue.

for cavity preparation or pulp removal. If you extract these teeth it will be necessary to block the lingual nerve on the lingual side. The time required for anesthesia will vary from 5 to 10 minutes if injection has been made properly. The needle used is either the one 30 millimeters in length or the 15 millimeter needle. Both needles are 23 gauge.

INCISIVE NERVE BLOCKING

This injection is used for blocking the lower incisors and proves of great value to the pyorrhea specialist. Insert the needle at the median line below the roots of the two incisors at a point where the lip blends with the gum tissue. Direct the needle downward, backward and laterally to an approximate depth of 10 millimeters, striking the floor of the incisive fossa. Inject one c.c. Retract the needle without removing it from the tissue and bring the syringe to the opposite side and repeat the technique for the opposite fossa in case the nerve supply for all four incisors is desired to be blocked. The incisive fossa have numerous small foramina which transmit branches of the incisive nerve and when the solution is injected at this point anesthesia is secured in most cases in 3 minutes. The needles for this injection are similar to those used for mental anesthesia. Always remember that it is necessary to block the nerve supply on the lingual side in case you desire to extract or do any kind of operative work which involves the structures on the lingual side.

INTRA-ORAL NERVE BLOCKING OF ANTERIOR SUPERIOR ALVEOLAR AND INFRA-ORBITAL NERVES.

I think I am safe in making the statement that more failures have followed the injection for these nerves than any other deep nerve blocking injections. I have had numerous dentists tell me that their results had not been highly satisfactory following their injection. It has been my pleasure to examine a large number of skulls in the various colleges, also cadavers and I have found in nearly every instance that if a line is drawn through the long axis of the second bicuspid tooth that this line will pass through the infra-orbital foramen. If the patient looks directly forward this line will also pass through the pupil of the eye. This has given me a key which has proven of much value in the technique of blocking the above named nerves. To follow this technique it is self evident that the patient must have normal occlusion, or at least the upper second bicuspid must be in its normal location. The technique I employ is as follows: Stand in front of the patient. Locate the infra-orbital margin with the left index finger. After the infra-orbital margin has been located bring the finger downward approximately 10 millimeters and hold same in this area during injection. The infra-

orbital foramen is located 10 millimeters below the infra-orbital margin in most cases. Have your patient look directly forward and observe that your index finger is directly beneath the pupil of the patient's eye. Draw an imaginary line from the pupil of the eye through the long axis of the second bicuspid tooth and the line will pass through the infra-orbital foramen. While your index finger is resting over the foramen lift the upper lip with the thumb, thus ex-



FIG. 20.

The above photo shows the branches of the infra-orbital nerve supply exposed, also the infra-orbital foramen. Note the needle is parallel to the long axis of the second bicuspid tooth.

posing the tissue in the region of the bicuspid. Insert the needle into the mucous membrane on the buccal side of the second bicuspid at a point where the cheek blends with the gum tissue. Carry the needle upward, directing it at a point beneath the index finger. Be very careful to have the needle parallel with the second bicuspid (provided patient has normal occlusion), as it will give you an excellent guide in locating the infra-orbital nerve. Do not come in contact with the periosteum except at the time the point of the needle

strikes the region in or near the foramen. Inject 2 c. c. of the solution. After a few minims of the solution have been injected you can readily detect the presence of the point of the needle and it will assist you in determining whether or not you have the needle in the right location. After the solution has been injected, gently massage the skin over the injected area, thus forcing the solution into the



FIG. 21.

Infraorbital Injection. Correct position of syringe for blocking anterior superior alveolar nerve, infra-orbital nerve and their terminations. Needle parallel with long axis of second bicuspid.

infra-orbital canal. This will anesthetize the anterior-superior alveolar nerve, which is given off from the maxillary division of the fifth nerve in the infra-orbital canal approximately 5 millimeters posterior to the infra-orbital foramen. The success of this injection depends upon the solution reaching this nerve (anterior-superior alveolar. The anterior-superior alveolar nerve supplies the upper central, lateral and cuspid teeth, also anastomosing with the dental plexus located over the bicuspid and with its fellow on the opposite

side. Therefore, if you require anesthesia of the central, lateral and cuspid teeth it will be necessary for you to block distal to the cuspid and distal to the central in order to block the nerve supply from the other branches. The needle used in this injection is 30 millimeters in length and 24 gauge. The time to wait for anesthesia is approxi-



FIG. 22.

Upper section of wet anatomical specimen showing termination of Infra-orbital Nerve and needle in its correct position for blocking this nerve and the Anterior Superior Alveolar Nerve.

mately 10 minutes. If you desire to remove these teeth, block the nerve on the lingual side.

BLOCKING THE ANTERIOR PALATINE NERVE.

This nerve enters the surface of the hard palate through the posterior palatine foramen. The posterior palatine foramen is located in most individuals midway between the lingual gingival margin of the upper second or third molar (depending on whether the patient is an adult or child) and the median line. In other words, it is located about 15 millimeters from the lingual gingival margin

toward the median line. The anterior palatine nerve passes anteriorly along the apices of the lingual roots of the upper molars and anastomoses with the naso-palatine nerve on the lingual surface of the cuspid tooth. The technique used for this injection is as follows: Pierce the mucous membrane directly over the foramen, holding your syringe across the mouth, allowing the barrel to rest upon the lower bicuspid on the opposite side. Pierce the tissue at a right angle. Insert the needle approximately 10 millimeters. Inject 7 or 8 minims of the solution. The time to wait for anesthesia is from two or three minutes. You will find you have secured anesthesia, if the

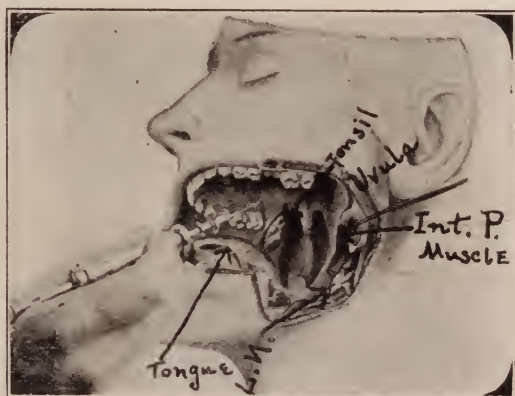


FIG. 23.

This illustrates position of needle for blocking the anterior palatine nerve as it emerges from the posterior palatine foramen.

injection has been properly made, as far anteriorly as the distal surface of the cuspid on the lingual side. The needle used for this injection is the same as for the infra-orbital injection.

INTRA-OSSEOUS ANESTHESIA.

This form of anesthesia has been used for a number of years and it has proven in the hands of some operators to be very valuable while in the hands of others it has not proven of great success and has been discarded, due to the fact that in most cases the technique employed for this particular branch of anesthesia was not carried out to an extent to produce good results. I have already spoken about the nerve supply of the two superior bicuspid and first molar. It is well, however, to again state that these three teeth are supplied by the middle-superior alveolar nerve, which is situated be-

neath the surface of the superior maxillary bone. It is impossible to reach this nerve with the needle. It communicates with the posterior and anterior-superior alveolar nerves thus forming the dental plexus. I am frank in making the statement that I have experienced more failures following the injection for blocking the nerve supply to these teeth than any other nerve blocking injection. This is contributed to by the fact that the nerves are located beneath the surface of the bone and when terminal or infiltration anesthesia was



FIG. 24.

This illustrates the double bladed lancet and intra osseous guide in correct position for blocking the zone in the region of the two superior bicuspid and first molar.

employed it was necessary for the solution to penetrate the various structures in order to produce anesthesia. Terminal or infiltration anesthesia in my hands for the blocking of these teeth has not been very satisfactory. It is true that excellent results can be secured from infiltration anesthesia in a young subject but in middle aged or elderly people the external alveolar plate is so dense it is impossible for the solution to infiltrate through it in many cases. Many dentists state the same results as I have experienced. Following infiltration anesthesia, it has not been possible for me to remove pulps or perform an apicoectomy without inflicting pain in many

cases. Following so many failures from infiltration anesthesia, I sought another method for blocking this zone which has not only proven very satisfactory for other areas. Dr. Otte was probably the first man to use and introduce intra-osseous anesthesia to the profession and it was used considerably, but due to not having a well defined technique it has been discarded by many opera-



FIG. 25.

Showing the intra osseous guide in position and the bi-bevel drill in use.

tor's. Nogue called the method "Anesthesie diploique." It has been my pleasure to work out a technique which has proven highly satisfactory in my hands as well as many other operators. We are all acquainted with the technique employed in years gone by which consisted of drilling an opening through the external alveolar plate with a drill or burr. This opening was not only made through the plate of bone but caused considerable laceration of the soft tissues and periosteum. Following this procedure the blunt needle was employed which was inserted into the opening and the

solution injected. Many times it was impossible to find the opening with the needle and it then became necessary to enlarge it. There was no contact between the needle and the bone, which allowed the solution to flow back around the needle and it was impossible to know how much solution was injected. This was not the only fault



FIG. 26.

This illustrates a practical case for blocking the two superior bicusps and first molar by the intra osseous method.

experienced, but the laceration of tissue and the chance of infection was always present. The new technique for this particular work is briefly as follows: The teeth and alveolar process is divided up into various zones which makes it a very easy procedure for the operator. The needle is inserted above and between the apices of the roots of the teeth. The mucous fold is thoroughly dried and the antiseptic solution applied. A double bladed lancet retractor and intra-osseous guide are employed in making the injections. The lancet has two

very small blades which are located a short distance apart. This instrument is held in the hand and the two blades are held together by the thumb and index finger, thus making one cutting edge. This instrument is now forced through the mucous fold which has been prepared with the germicide solution and by injecting a few minims of the anesthetizing solution which eliminates all



FIG. 27.

Note the intra osseous guide in position and the needle being forced through same. The solution is now ready to be injected.

pain caused by the lancet. The small blades which are in contact are forced through the tissue until they strike the external alveolar plate, and at this time the tension is released and the blades are allowed to separate, which separation is gauged on the instrument. This prevents all laceration and protects the tissues. While this instrument is in place the intra-osseous guide is forced down between the blades until it rests upon the bone. The lancet is now removed and the guide remains in position which is ready to receive the drill. The templet part of the guide is 7 millimeters long and is

held at right angles to the surface of the bone. The drill is next employed which is bi-bevel in shape and is very small. It is a fraction smaller than the needle which follows this particular phase. The needle is blunt and 10 millimeters in length. It is forced through the templet and by a little rotating movement it is forced into the opening made by the drill which is a fraction smaller. The needle being 3 millimeters longer than the templet gives perfect con-



FIG. 28.

The arrow to the extreme right indicates area of anesthesia produced following the tuberosity injection. The "X" shows point of intra osseous injection, and the left arrow indicates anesthesia obtained to the median line; while the middle arrow indicates anesthesia in opposite direction, thus joining the area anesthetized by the tuberosity injection.

tact between the needle and the bone. The solution is now injected and the amount of solution depends upon the size of the area to be blocked. The needle is now withdrawn, the templet removed, the tissues allowed to come together and the germicidal solution is applied to the area. It is impossible in most cases to detect where the solution has been injected because there has been absolutely no laceration. The advantages of this method are no laceration of tissue, a definite amount of solution is injected, perfect and quick anesthesia is obtained, no back flow of solution, and the elimination

to a great extent of any post-operative infection as was experienced many times heretofore.

EXTRA-ORAL NERVE BLOCKING FOR ORAL SURGERY.

This method is to be employed when the intra-oral method is

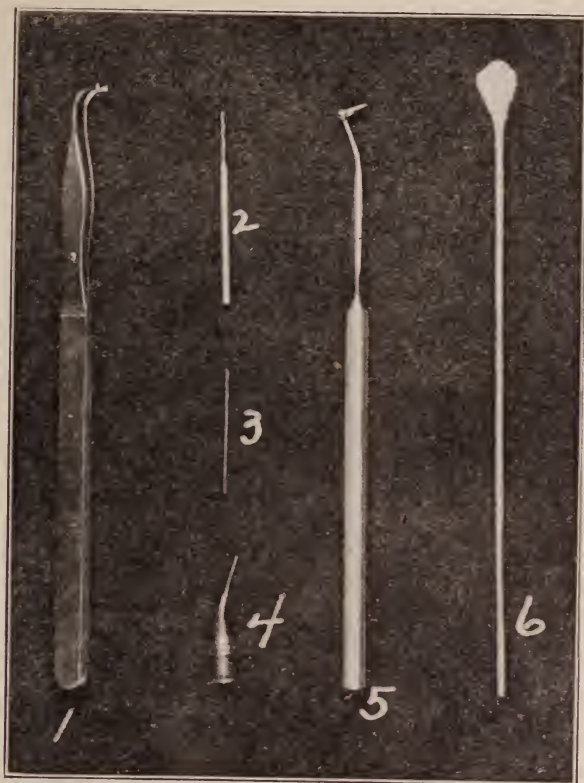


FIG. 29.

This illustrates appliances for producing intra osseous anesthesia. No. 1, the double bladed lancet and retractor. No. 2, the small bi-bevel drill of known length. No. 3, extra drill. No. 4, platinum iridium needle. No. 5, intra osseous guide. No. 6, wooden applicator for applying antiseptic solution.

contra-indicated. In nearly all operative cases the nerve branches can be blocked by the intra-oral method; however, the intra-oral method is not the method of choice under certain prevailing conditions. The extra-oral method should be employed in those cases where pus or a great amount of inflammation is present within the oral cavity, or in cases of impacted third molar of the third degree

type, accompanied by pus, inflammation and trismus. The extra-oral method is of great advantage in cases of fracture of either jaw which is accompanied by tenderness and swelling; also, in antrum operations, removal of tumors, as well as any other pathological condition in which the operator deems the intra-oral method contra-indicated. Braun was one of the first to present extra-oral anesthesia; however, it has not been employed to any extent until recently for oral and dental surgery. It has been the writer's experience to carry out considerable research work on cadavers, and has demonstrated the technique for extra-oral injections and anatomical specimens, as well as making a large number of injections on patients in the clinic. I trust the simplified technique presented here for extra-oral as well as intra-oral methods will prove of value in oral surgery and to general practitioners. It has been my aim in all technique worked out to make it simple and practical, combining efficiency with ease in executing any injection.

EXTRA-ORAL BLOCKING FOR THE INFERIOR MAXILLARY OR THIRD
DIVISION OF THE FIFTH NERVE.

The skin through which the needle is to be inserted must be thoroughly prepared. The part must be thoroughly cleansed and followed with an application of bichlorid solution or tincture of iodine. Make an initial injection into the skin with a fine, sharp needle in order to eliminate the pain which would be caused by the regular needle for the deep injections. After this initial injection has been made the long needle is used, which is 23 gauge and 5 cm. long.

The following technic is employed. Have patient open and close mouth slightly. Locate the space between the lower portion of the zygomatic arch and the upper portion of the ascending ramus, between the coronoid process and the condyle of the mandible. The following landmarks are carefully followed. Before the skin is prepared draw a line parallel to the lower margin of the zygomatic arch directly above the sigmoid notch on the mandible. Connect the two ends of this line by following the lower border of the sigmoid notch. This will give a semi-circle and indicates the location of the sigmoid space. Puncture the skin with the needle in the center of this area, allowing the needle to form a right angle with surface of skin. Now direct the needle inward to a depth of 4 cm. iodine. Make an initial injection into the skin with a fine, sharp

should be one centimeter anterior and inferior to the foramen ovale which transmits the third division of the fifth nerve. Inject 3 c. c. of the solution. Anesthesia of the lower jaw on side injected should occur in from 7 to 15 minutes.



No. 30.

Note position of the syringe for blocking the third division of the fifth nerve at a point one centimeter anterior and inferior to the foramen ovale. The needle is held at right angles to the skin surface.

EXTRA-ORAL METHOD FOR BLOCKING THE SUPERIOR MAXILLARY OR SECOND DIVISION OF THE FIFTH NERVE.

The blocking of the superior maxillary division of the fifth nerve in the speno-maxillary fossa is as easily accomplished as the blocking of the third division. First locate the anterior surface of the ascending ramus and the anterior margin of the coronoid process of the mandible. Next locate the lower margin of the zygomatic arch in this region. Now draw a line along the lower margin parallel to the zygomatic arch. Next draw a line parallel and anterior

to the coronoid process of the mandible, which is in a perpendicular position. A right angle is now formed. Now connect these two lines with another line thus forming a triangle. After the skin has been treated aseptically, a puncture is made with a fine needle in center of triangle for the initial injection. Then use the same needle as is used for blocking the third division. Direct the needle

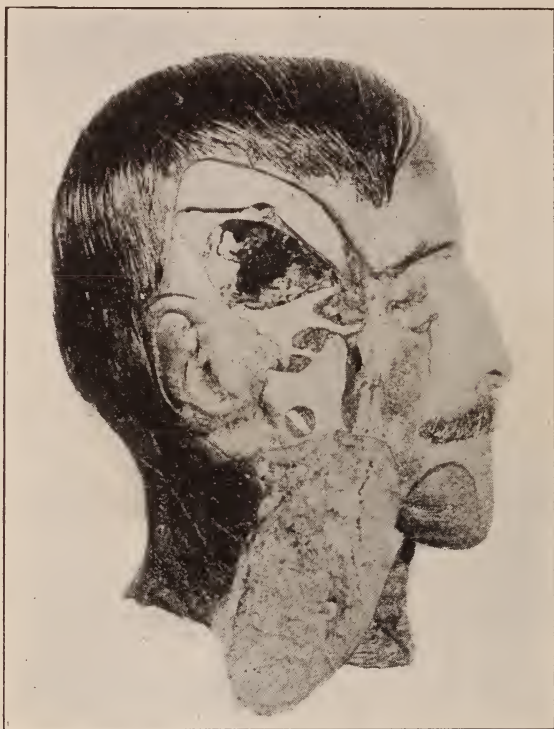


FIG. 31.

Note the first, second and third division of the fifth nerve.

backwards, inward and upward for a depth of 20 mm. In the average case the point of the needle should strike the periosteum covering the posterior lateral tuberosity of the superior maxillary bone. At this point is located the posterior-superior alveolar foramen containing the posterior-superior alveolar nerve. The point of the needle strikes the periosteum thus indicating the needle is going in the right direction. Force the needle past the tuberosity 20 more mm.

The point of the needle should then enter the region of the second division of the fifth nerve within the spheno-maxillary fossa. The point of the needle should be located just posterior to the posterior-inferior margin of the orbital cavity while the solution is being injected. Inject three cubic centimeters. The depth of the needle



FIG. 32.

Extra oral method for blocking superior maxillary division of fifth nerve. The needle is directed backward, inward and upward until it reaches an area anterior to the foramen rotundum.

in the average adult case is four centimeters. The needle should be five centimeters in length. Anesthesia is secured in most cases in from five to fifteen minutes. The structures anesthetized include the following: All structures supplied by the second division of the fifth nerve such as the superior maxillary bone, teeth, antrum, gum tissue, portion of cheek, periosteum and half of palate, etc.

EXTRA-ORAL METHOD FOR BLOCKING THE INFRA-ORBITAL AND ANTERIOR SUPERIOR ALVEOLAR NERVES.

Locate the infra-orbital foramen with the index finger, then

bring it down, allowing it to rest directly over the foramen which is located at a point 1 centimeter beneath the infra-orbital margin. Use a fine sharp needle as described heretofore for the initial injection. Now follow the initial injection with the regular needle which is of iridio-platinum, 24 gauge and 3 centimeters long. The injecting needle is now forced upward and backward to a depth of 1 centimeter in the majority of cases. Inject 2 c. c. of the solution at the



FIG. 33.

Wet specimen which has been prepared to show important structures located in the speno-maxillary fossa. Needle No. 1 shows position for blocking the third division. Needle No. 2 for the second division.

opening of the infra-orbital foramen. Next massage the skin directly over the area injected, thus forcing the solution backward into the infra-orbital canal to a distance of 5 mm. in most cases, thus allowing the solution to come in contact with the anterior-superior alveolar nerve. Anesthesia is secured in the following structures in less than 5 minutes: Central, lateral and cuspid teeth, side of nose, upper lip, alveolar process, labial tissue, anterior wall of antrum, and periosteum providing the anastomoses are blocked on the opposite side of the median line and of the middle-superior alveolar nerve branch.

EXTENT OF APPLICATION.

Local anesthesia may be employed for any operation around the face or about the jaws provided the operator understands his anatomy and is careful and exacting in his technique. It is absolutely necessary for the operator to know what nerves are to be blocked and how extensive an area of anesthesia must be produced in order



FIG. 34.

This illustrates the blocking of the palpebral, nasal, labial, and anterior superior alveolar nerves which are branches of the infra-orbital nerve, by the extra oral method.

to operate without inflicting any pain during the operation. If the operation is for the removal of a malignant growth or even a benign condition or the curetting of necrosed bone or treatment of empyema of the antrum, local anesthesia has an advantage over a general anesthetic for the reason that in most cases the patient will consent to an earlier operation. Last but not least one may add that nerve blocking anesthesia renders the area of operation less bloody and the operator is not handicapped by a general anesthetic mask. Many anesthetists and oral surgeons who have familiarized themselves

with this method of anesthesia state that it has many advantages over general anesthesia in the majority of cases. However the operator must carefully select between general and local anesthesia and never be too hasty in his decision. Local anesthesia has its contra-indications, so does general anesthesia, so the dentist who masters the technique for both methods can render better service than to simply apply any single method.

NERVE BLOCKING ANESTHESIA FOR TONSILLECTOMY.

During the past few years I have spent considerable time in working out a nerve blocking technique for the removal of the tonsils. My findings along this line have been very satisfactory and it gives me great pleasure in presenting this technique to the eye, ear, nose and throat specialist. We are well aware of the fact that the medical man has not followed a definite system in injecting the solution. He has injected the solution promiscuously into the pillars of the tonsil and tonsillar tissue and in many cases the tissue has been in a state of degeneration, containing pus and necrotic material. We are aware of the fact that when solution is injected into tissue of this character there is great danger of disseminating infection and carrying infected material into healthy tissue. I am quite sure that no learned dentist would be guilty of injecting solution into inflamed tissue or an alveolar abscess. It is impossible for me to give the detailed technique for blocking the tonsils by the deep nerve blocking method but I will attempt to give the nervous anatomy and a brief outline of the technique. The tonsil derives its nerve supply from two different sources. Its principal nerve supply comes through the branch of the glosso-pharyngeal which unites with the branches from the pharyngeal plexus, thus forming the tonsillar plexus which is located at a point posterior lateral to the base of the tonsil. The second supply is from Meckel's ganglion which is located in the spheno-maxillary fossa, which gives off a number of branches. The branches which interest us just now are the nasal, pharyngeal, naso-palatine, anterior, middle and posterior palatine. The anterior palatine passes through the posterior palatine foramen and supplies the tissues in the soft and hard palate communicating with the naso-palatine branch which passes through the anterior palatine thus forming the inner nerve loop. The middle palatine nerve is distributed to the mucous membrane of the soft palate, uvula, and palatine tonsil. The posterior palatine branch supplies

the mucous membrane of the tonsil, soft palate, uvula and a portion of the pillars. The technique for blocking the tonsil is as follows: The plexus tonsillaris and the pharyngeal plexus are located posterior and lateral to the base of the tonsil. These structures are blocked by inserting the needle midway between the occlusal surfaces of the upper and lower teeth, puncturing the mucous membrane at the base of the tonsil beneath the plica semilunaris and directing the needle backward and laterally to a depth of approximately 2 cm. 2 cubic centimeters of the solution is injected. The other nerve supply of the tonsil which is from branches of Meckel's ganglion is blocked in the same manner as given above in the technic of blocking the second division of the fifth nerve by the intra-oral method, with the exception that the needle is not forced in to the depth of 3 cm. but 2 centimeters in the average case, thereby anesthetizing the palatine branches which are located in the speno-maxillary fossa. We are aware that it is difficult to carry out the technic on a very young person unless the operator can obtain and maintain the confidence of his little patient. In my opinion this method proves of exceptional value for the removal of tonsils and will prove of great advantage in many cases over general anesthesia.

As stated at the beginning of my lecture this evening, it is absolutely impossible to cover only a small number of injections and even those I have covered very briefly. The subject of nerve blocking is a broad one and considerable time must be given in order to cover the subject in detail.

In conclusion allow me to say that there has been no discovery or method used in the practice of dentistry for the purpose of enabling us to do better work resulting in more satisfied and grateful patients than that accomplished through the medium of the relief of pain. The progress of dental science has been wonderful during the past ten years, and it is gratifying, I know, to every member of our profession to see what has been done in research work in all its phases, and to my mind the relief of pain is appreciated most of all by the patient; the proof of this statement is manifested by the enthusiasm of the patients who have been operated upon and who go on their way rejoicing, praising the dentist who rendered them such service. The dentist who familiarizes himself and becomes proficient in the relief of pain and who gives his patients the benefit of his knowledge is the one whose services will be a pleasure—and his

patients will speak more words of praise and commendation for him; he will be enabled to render his patients a higher professional service, and will not be handicapped in his operations.

The immediate field of operation that the dentist is called upon to treat is supplied by the fifth pair of cranial nerves; perhaps the most sensitive of the human body; especially is this true regarding pain, which is the only sensation conveyed by the dental pulp.

We are living in a time when the public demands services with the least amount of pain. Therefore, it is the duty of every dentist to study and apply that which the science of medicine and chemistry offer. The day of the practitioner who contends that a light touch and a sharp bur is all that is necessary in modern practice is rapidly passing, and all antiquated methods and ideas will be in the archives of discarded things, and he will have to grasp the tool of efficiency and travel with the modern trend. It is self-evident that an operator can render better service when the patient is free from pain, as he can better remove the decayed dentin and prepare cavities scientifically.

When service can be successfully and painlessly rendered without endangering the health of the patient, it is always advisable; for any agent that has for its object the relief of pain is worthy of our earnest consideration and study.

ORATION.*

BY DR. A. W. THORNTON, MONTREAL, CANADA.

Mr. Chairman, Ladies and Gentlemen:

It would be the veriest hypocrisy for any man to pretend that he did not look upon such a privilege as is mine to-day, as a very great honor, and it would be an insult to your intelligence to expect you to believe that such an occasion is one of the ordinary events of any man's life.

I appreciate the honor, and feel the responsibility more deeply perhaps than any of you can imagine.

Any ordinary man might perhaps have some knowledge of the application of colors to a canvas, might possess some ability in free-

*Delivered at the Dedication of the Memorial to the late Dr. G. V. Black, Chicago, Aug. 8th, 1918.

hand drawing, might understand the underlying principles of perspective, but such knowledge or such ability would not justify a person in attempting to paint a landscape or a portrait, to hang in an Art Gallery with the world's masterpieces.

And so, it appears to me, the occasion that brings us together at this moment, demands the effort of a "workman that needeth not to be ashamed" to worthily deal with the subject which has been assigned me. Let me say to you in absolute frankness and in perfect honesty, that I feel totally incapable of measuring up to what you have a right to expect. But when your President asked me to undertake this duty, there was but one thing to do,—accept.

And, if I fail adequately to express the love which we all felt for the man to whose life and labors this memorial is dedicated, let your own full hearts at this moment be the measure of that appreciation, which my poor words must fall short of expressing.

As I tried during the past weeks, to think of the exercises in which we were to take part to-day, there came to my mind again and again, the words of King David, spoken three thousand years ago of Abner, "A Prince and a great man is fallen." The term "a great man" is frequently heard, and yet, to what a comparatively few men, can the words be fitly applied.

In Law, Moses stands preeminent, for the simple reason that the moral Law, the Ten Commandments, stands to-day as it stood three thousand five hundred years ago, the very foundation principle of national as well as of individual greatness.

In Sociology, the world has seen but one perfect example, The Man of Nazareth. In a few sentences, He laid on bed rock, the basic principles of ethic relationship between man and man, and between nation and nation, and the violation of these principles by a powerful European nation, is the cause of the terrific struggle now convulsing the world. Let me quote just a sentence or two, embodying some of His foundation principles:

"Whatsoever ye would that men should do to you, do ye even so unto them likewise." "I came not to be ministered unto, but to minister." "Let him that would come after me, deny himself." "He that loseth his life shall find it, shall keep it unto life eternal."

Read to-day, the Biography of the world's great men and you will find a striking similarity in life and thought and purpose in all of them. What man or woman can possibly attain to greatness and

persistently violate any one of the Ten Commandments? Would you call any man great who would attempt to deal with his fellow-man as he would not wish a fellowman to deal with him? Could a man by any stretch of imagination, be called great, who was always receiving the ministrations of others in selfish enjoyment? What man to-day has the greatest chance of being classed with the world's great men? Is it not the man who has learned most perfectly, the lesson of self-denial?

In the world's great cataclysm at the present time, who are the men whose names and whose memories are being enshrined in the hearts of all right thinking persons? Are they not the men who are losing their lives in order that national and individual lives may find a chance to express themselves along God given lines? And was it not along the lines that I have just indicated that the life of the man whose memory we have met to honor, found expression?

Think of the work accomplished in a single life time. It was fundamental in character, it was stupendous in volume. When his own operations, as well as the operations of other men failed, he sought the reason of the failure and the means by which failure might be avoided, and he gave to the profession scientific methods of operation which shall bless humanity while time lasts.

There is a question that must be ringing in the mind of every man here present. It is this: Why is it that men such as Dr. Black are able to accomplish so much while most of us do so little? Is the difference between such men and the rest of us simply one of mental endowment? Are these men mental giants and the rest of us mental pigmies? No. I think not. What then is the reason? Is this the explanation? Only a few men in each generation are capable of sustained effort, and this perhaps is the secret of all true greatness. Longfellow has expressed that thought in these words:

"We have not wings, we cannot soar,
But we have feet to scale and climb
By slow degrees, by more and more
The cloudy summits of our time."

"The mighty pyramids of stone
That wedge-like cleave the desert airs,
When nearer seen and better known,
Are but gigantic flights of stairs."

And is this not the secret of the unparalleled success of him whose memory and whose life work we delight to honor? Do you know that it takes fifteen pages of ordinary magazine size, in very small type, simply to give the titles of Dr. Black's contributions to the Profession, of which he was the most distinguished member? The desire to attain to his own full stature must have taken possession of him even in early life.

Some years ago, I attended with Dr. Black and a number of other men from Chicago, the fiftieth anniversary of the St. Louis Dental Association. At that meeting, Dr. Black showed some lantern slides of sections of teeth that he had made years before, by hand, with a pen and India ink, before such slides were made by photography, and they were as accurate and almost as delicate as those made by the scientific apparatus now available.

But the books which he wrote, the contributions which he made to so wide a field in science, the teaching he did in a great University, these are not the things that call out to-day, this voluntary expression of gratitude and esteem. We admire the ability which enabled him to overcome, where smaller men must have met with failure. We acknowledge the debt we owe, because we are able to accomplish things which would have been altogether impossible had he not blazed the pathway to success.

We feel keenly our own lack of attainment, when we think of him "in labors more abundant" but, we loved him—not for what he did, but for what he was.

Many of the men taking part in this exercise to-day, have a mental picture of him as they knew him best. Some will think of him as they met him at professional gatherings and the outstretched hand, the genial smile, the kindly word, seem to forge again the link that was broken, and they wonder if it can be indeed true that the "Silken cord has been loosed." Others, especially the members of Faculties from other Schools, will have a vision of him in his own school, as the hearty, unassuming welcome was extended. Others, perhaps by far the largest number, will think of him as he walked through the Infirmary, dropping a hand on a shoulder here, offering a word of advice there, giving a little help with an operation some other place, and as he did so, many a difficult operation became easier, many a problem was more readily solved, many a down-

hearted student felt that a veritable benediction had come "By the laying on of hands."

But why, may I ask, are we to-day, dedicating and unveiling a memorial to Dr. Black? Why in all ages and in every country, have monuments been raised to great and good men?

"Can storied urn or animated bust,
Back to its mansion call the fleeting breath?
Can honor's voice provoke the silent dust?
Or flattery soothe the dull cold ear of death?"

We all know that this can mean nothing to him, who so short a time ago, joined the great company of those whom "We have loved long since and lost awhile." Why then do we do these things?

Two reasons, perhaps, actuate us: The first, to show to the world and to his immediate dear ones, that we loved the man, and appreciate the life work, fraught with such momentous importance to all future generations; and in the second place, to inspire others to lead lives, devoted as his was, to the amelioration of suffering and to the extension of scientific education and individual culture, the only foundation upon which it is possible to rear the superstructure of national and individual greatness, happiness and prosperity.

More than three thousand years ago, that greatest of all questions was asked, "If a man die, shall he live again?" It has never been answered as we would answer or prove a proposition in Euclid so that we might write after the answer, "Which was required to be demonstrated."

But strange indeed would be our conception of creation or evolution, whichever you wish, if having ears, there were no song of birds nor laughter of children, no strains of sweet music nor articulate sounds of loving voices. It would be strange would it not, if having eyes to see, there were no rosy morns nor glowing sunsets, no green valleys nor snow capped mountains, no mountain torrent flashing its myriad of crystals in the sun, nor placid lake reflecting back the softened rays of a harvest moon; no sky, and flowers and trees.

So, I believe that in some way, the greatest yearning of the human soul, its capability for love and service and companionship will be satisfied "When the golden bowl is broken, when the pitcher

is broken at the fountain, when the wheel is broken at the cistern and the Spirit returns unto God who gave it."

To have known a man like Dr. Black, to have enjoyed his friendship, to have felt the warmth of his social nature, to have feasted mentally so often and so bounteously on the satisfying mental pabulum of his production, is to intensify and make more real the belief that "When the earthly house of this tabernacle is dissolved, we have a building of God, an house not made with hands, eternal in the Heavens."

In the Genesis account of creation, it is said that God created man in his own image and likeness. It is in the lives of such men as Greene Vardiman Black, that the eternal, the infinite, the loving nature of God is most clearly discernible. In the early ages, the passing of such men was spoken of in some such words as these: "Having served his day and generation, he has fallen on sleep."

Could words be truer of any man than of Dr. Black: Having served his day and generation, full of years and of honor, loved most by those who knew him best, "He has fallen on Sleep." May "a double portion of his spirit" fill all our hearts.

Perhaps Dr. Black's philosophy of life, life here, life hereafter, might be summed up in the following words:

"For me to have made one Soul,
The better for my birth;
To have added but one flower
To the garden of the earth;

"To have struck one blow for truth,
In the daily fight with lies;
To have done one deed of right
In the face of calumnies;

"To have sown in the souls of men
One thought that will not die,
To have been a link in the chain of life,
'Twill be Immortality."

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTY-FOURTH
ANNUAL MEETING, HELD AT BLOOMINGTON,
MAY 14-17, 1918.

DISCUSSION OF DR. ARTHUR E. SMITH'S PAPER ON "NERVE BLOCKING."

DR. P. G. PUTERBAUGH (Chicago):

Mr. President and Members: I certainly do feel that this Society should be congratulated upon receiving this very extensive review of conductive anaesthesia and I want to compliment Dr. Smith upon the vast amount of work that he has done in order to get this into shape to give to us tonight.

There are a few points that might be worth emphasizing in passing. One is the duration of anaesthesia. I have found from experience with younger patients, that many times the anaesthesia does not last as long as with patients in middle life, and you must bear in mind that sometimes in children it lasts for only a few minutes. I have had children up to fourteen or fifteen years of age where the anaesthetic would last perhaps for five minutes, when it would last from half an hour to an hour in adults. In my opinion there is something in the blood supply to tissues of children and young adults that shortens the duration of anaesthesia.

In my work I prefer not to inject directly into the foramina. I inject in the region of the foramina as Dr. Smith has indicated. Some men inject into the foramina; but one artery and two veins accompanying each nerve, and the chances are more in favor of injecting these arteries or veins if you inject into the foramina than if you inject in the vicinity of the foramina and force the solution in gently by massaging. In injecting the incisive foramen, or the anterior palatine, I have had patients complain of nausea immediately following. For that reason I now inject either over the foramen or laterally, on one or the other side. I would prefer to make my injections at a point just far enough distant from the seat of operation to get the anaesthetic result. We had an experience at the college about three or four weeks ago that is liable to come to almost anyone if they be not careful. We had a student break a needle off in

a needle with a long hub and he had to insert the needle to the hub in order to get the needle point in the vicinity of the mandibular foramen. The needle broke off in the tissue. Later the patient complained of pain and the X-ray showed the needle in there. This accident might not have happened if he had used a long needle with a short hub. In these deeper injections one should be very cautious about inserting the needle to the hub in the soft tissue, because if the patient should move an accident would happen and it is much better to pull it out by that quarter of an inch sticking out there than to be unable to grasp it.

As to the anaesthetic solution, I would say that conductive anaesthesia gives you a chance to try out your favorite local anaesthetic. Many times we really get soreness and pain from the injection and say it is from the operation as from the extraction of a tooth. If you are not using a solution that is isotonic or that is sterile, you will undoubtedly get after soreness from that injection; or if you use too much pressure on the piston you will have pain and soreness afterwards. If these injections are made properly—if you sterilize the needles first, if you use a solution that is non-irritating and inject it slowly, you will have no trouble. In the mandibular injection or the superior maxillary, you should take from half a minute to a minute to diffuse it in that vicinity. If you get the solution in the vicinity making a mandibular injection. The reason was that he used of the nerve you will get anaesthesia that will leave nothing to be desired. The anaesthesia is absolute and the after soreness is nil, providing, of course, that the solution is right.

A two-inch extension hub on the syringe is quite advantageous. In that way I do not need to get the barrel of the syringe into the patient's mouth, and in refilling the syringe I can unscrew the long hub and fill the syringe without any infection having gotten on the hub from the patient's mouth. And then in reaching back in the oral cavity the extension hub gives one plenty of room. Intraosseous anaesthesia I look upon as a stunt whereby one can get results, but the use of intraosseous anaesthesia is seldom needed by the practicing dentist because other methods give him the same result. I do not like the idea of taking a bur and drilling through the labial plate

of process if one can get his solution into the soft tissue by conductive injection. Then, too, if we have satisfactory results from the intra-oral injection I see no real necessity for the puncture of the cheek in making of an extra-oral injection. The danger of complication is somewhat increased in that injection and the puncture of the skin is more painful than the puncture of the mucous membrane.

DR. F. F. MOLT (Chicago):

I want first to compliment the Doctor on his moving pictures. I think he has missed his calling. He should be in the moving picture game.

I know how Dr. Smith has lived with his work for the last three or four years, and how thoroughly he has worked out his technique. For discussion there must be a difference of opinion, and between Dr. Smith and myself there is no difference of opinion, for I have followed his teachings for some time.

A point I want to emphasize is that a knowledge of anatomy is essential. I have recently seen two or three cases like that Dr. Puterbaugh spoke of where the needle was broken off in a very peculiar position—one where the point of the needle was at the back of the ramus. Quite naturally with the needle imbedded that way, when the patient moved suddenly, the needle was broken. The steel needle is not the one to use; it is much more easily broken than the platinum needle.

Many men speak of the failures they get with these injections, but I think, as Dr. Smith says, that failure in almost every case is due to faulty technique in some way—either the solution is not isotonic or not properly mixed, or the technique of the injection is faulty.

The making of these solutions, I think, will be much simplified when Dr. Smith's new tablets are put on the market, as the constituents are so divided that each tablet contains sufficient for one c. c. of the solution. Now we have to prepare at least ten c. c. of Ringer's solution and then decant down to what we want to use, so when we have these tablets it will simplify matters very decidedly.

With Dr. Smith's permission I will give the constituents of the solution that he uses for the syringe. These are Dr. Smith's proportions, and one particular reason for using it instead of

ing. I agree with practically everything both these gentlemen have said in the discussion of the work, and as the hour grows late, I will not detain you very long. With reference to injecting alcohol is that you avoid any possibility of injecting a small amount of alcohol with your solution. The R is given according to the metric system, as follows:

R—Phenol	20
Menthol	50
Sod. bicarbonate	30
Glycerine	100
Distilled water q. s.....	1,000

Another point that Dr. Smith has often emphasized is that if in using tincture of iodine we use $3\frac{1}{2}$ per cent solution which is one-half the commercial strength, we will get much better results than if we use the commercial quality.

As regards the extra-oral injections I differ with Dr. Puterbaugh; because I think in many cases the extra-oral injections are called for when there is so much infection around the particular area in which we have to work that the intra-oral injection is contra-indicated.

I think also, that in the reconstruction work we will be called on to do for men returning from the war zone, there will be many cases where all of our landmarks in the mouth will be obliterated, and we will have to use the extra-oral injections many times. I want to again compliment Dr. Smith upon his paper.

DR. ARTHUR E. SMITH, Chicago, (closing):

I wish to thank Drs. Puterbaugh and Molt for their kind and complimentary remarks in their discussion of my work this evening. The solution into the foramina, I do not think this procedure would be very good practice from the fact there would be some chance of puncturing a blood vessel with the needle. It is much easier at this particular point to puncture a blood vessel from the fact the vessel is located between the point of needle and the bone. Therefore, it does not have the opportunity of passing by the side of the needle as when it is located in the soft tissue. There is nothing gained by inserting a needle into any of the foramina, as anesthesia would not be obtained any quicker following such practice than from injecting the solution at the opening of the

foramen. The discussion has brought out a number of important phases with reference to nerve blocking technique that I could not possibly cover in one evening. Dr. Puterbaugh has raised the question of proper needles and I am glad to hear him say that he employs platinum iridium needles in most cases. I am an extreme advocate of platinum iridium needles and use them almost exclusively. The set of needles I employ consists of seven in all. This includes a specially designed set sufficient for all nerve blocking injections including extra-oral and intra-oral methods. The platinum iridium needle is the cheapest one to use in the long run and they have several advantages over the steel needles. They will not break as easily, will not rust, and can be placed in a flame and brought to a red heat to sterilize them.

With reference to the various depths of inserting the needle for blocking the various nerve trunks, I gave this evening the approximate depth only. I am quite aware of the fact that it is not possible to say that a certain nerve trunk is located a certain number of millimeters from the surface. Their position is fairly constant, but if we say to insert the needle a given depth on all individuals, it would be entirely wrong. We must take into consideration the size of the individual, whether the patient is a child or an adult, and whether or not there is much adipose tissue present, as well as an excessive amount of mucous membrane through which to insert the needle. However, I have found it to be a great advantage to those I have instructed in this work to give them an idea as to the approximate depth of the various nerve trunks, and then when they make an injection they must use good common sense and bury the needle as the condition indicates.

I did not have time tonight to go into the subject of my technique thoroughly for intra-osseous anesthesia, but I wish to state again at this time that this method has been of exceptional value to me as well as a large number of operators who are acquainted with the technique. This method has really filled in the "missing link" in nerve blocking. I would like to ask Dr. Puterbaugh what he does in those cases in which he makes an infiltration injection over the bicuspid or the first molar upon a patient say sixty years of age, and after he waits a sufficient

length of time for anesthesia to take place, he finds that it is impossible to remove the pulp or do other operative work? We know that the older the patient the denser the alveolar plate and instead of the plate of bone porous in the young individual, it is of a very dense consistency, and in such cases it is impossible for the solution to infiltrate through it in order to reach the desired nerve. As I have stated before tonight, infiltration anesthesia in my hands has been absolutely a rank failure in a large percentage of cases in which I desired to remove the pulp from the bicuspid or first molar. It is true that I obtained very good anesthesia but not sufficient to allow me to open a live tooth and insert a broach into the canals and remove the pulp. It was from this fact that I have worked on the technique of intra-osseous anesthesia. How do you handle these cases, Dr. Puterbaugh?

DR. P. G. PUTERBAUGH:

In my experience those cases where I could not anaesthetize by injecting subdorsally the over-hanging of the roots, I sometimes make a palatine injection as well. Personally, I have not felt the need of the intra-osseous, because I have been able to get anaesthesia by going in there.

DR. ARTHUR E. SMITH:

With reference to the extra-oral method, it is of great value to the operator in many cases, and it certainly is going to be of exceptional value to the dentists and oral surgeons in treating war injuries. The soldiers who have received wounds, such as fractures and lacerations and have infection or inflammation, and it is impossible for them to open their mouths for the intra-oral injection, therefore, the extra-oral method will be of great value. Many cases which present themselves to our offices, say for an impacted lower third molar with infection, I personally believe it is much better to make an extra-oral injection and eliminate the possibility of carrying bacteria into the tissues by the intra-oral method. As to the idea of inserting the needle from the outside, I cannot think of any objection to that any more than the insertion of an ordinary hypodermic needle. Just because the needle is inserted through the skin doesn't signify the injections should not be made when they are indicated.

I wish to thank Dr. Molt for his kind remarks with reference

to the technique I have worked out for many of these injections. It is true that I spent considerable time in research work in anesthetics, preparing dissected specimens and laboratory work, but I do not wish credit for anything that is not due me. Some of the technique shown here tonight has been worked out by various operators. It has been my pleasure to modify practically all of the injections, also to work out a number of new ones, and it has always been my object to make the technique as simple and as efficient as possible. To a large number of research workers are due a great deal of credit for the great work they have done on this important link in anesthesia, and as time goes on each research worker will add something and the time is not far distant when the technique will be much better than is practiced today.

It has been my pleasure to give a number of lectures and clinics before various Study Clubs and Dental Societies in the various parts of the country, and it is very gratifying to me to see the great interest that has been shown in this subject, and I am quite sure that the time is not far distant when more operators will see the great advantages afforded them by familiarizing themselves with the various methods used in the elimination of pain.

The subject of local anesthesia is practically inexhaustible and I only wish I had more time other than has been allotted me to cover the subject as it justly merits, and in closing I want to impress upon you that the technique for nerve blocking must be mastered, giving strict attention to dosage, isotonia, and sterility of the injecting solution, and last, but not least, strict asepsis must be observed at all times.



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DENTAL SERVICE IN THE ARMY, AND DENTAL EDUCATION AS INFLUENCED BY PRESENT WAR CONDITIONS.

At a conference called at Washington on Sept. 11, 1918, announcement was made that authorization had been secured for the commissioning and assignment, before July 1, 1919, of between nine and ten thousand dental officers. The total number of dentists holding commissions at this date is 5,981. The present number of dental officers on duty is 3,500.

The present authorization will call for the commissioning before June 1, 1919, of at least three thousand (3,000) additional officers, and there probably will be commissioned five thousand (5,000) additional officers by that time.

Examinations for dentists desiring commissions in the Dental Corps of the United States Army** will be opened in the immediate future first for such dentists as are now or may hereafter be acting as privates in various camps in this country and with troops overseas. Commissions will then be granted to the successful candidates as vacancies exist for the assignment of additional dental officers for the strength of the army on that date.

In reference to civilian dentists who are at home and desire commissions in the Dental Corps and are of conscription age and registered on September 12, 1918, no authority exists at this time for granting commissions for men who have not been inducted into military service. Should the regulation change and permit the commis-

**Term Dental Reserve Corps, by recent act, has been discontinued and hereafter all dentists serving in the U. S. Army are referred to as members of the Dental Corps, U. S. A.

sioning of men, subject to draft, before being inducted into the military service, a decision will be reached upon commissioning such conscripts.

The only positive statement that can be made in reference to this question at this time is, so long as we have conscripted dentists in camp acting as privates, examinations will not be opened for dentists of conscription age who are at home. Vacancies existing for the assignment of dental officers will first be filled from among those who now hold commissions and desire immediate active duty. Second, men who secured commissions and are acting as privates.

One dental officer will be assigned to each 500 of the average total strength of our troops in training in the various camps in the United States. Three dental officers allowed for each one thousand bed hospital in the United States. Two dental officers allowed for each base hospital for overseas service. One dental officer allowed for each evacuation hospital for overseas service.

The number of enlisted men to serve as dental assistants and dental mechanics is so much in excess of the number of dental officers to permit the assignment of four enlisted men of the medical department as mechanical dentists, three for the camp organization and one with each hospital located in the United States.

This will make it possible to rapidly construct all the partial dentures needed.

Dental assistants are authorized in the same grades and percentages within the grades as allowed for the enlisted men of the medical department up to and including the grade of sergeant of the first class.

In dental educational matters information was furnished the deans by Colonel Rees, member of the general staff and chairman of the Committee on Education and Special Training, that all dental schools which were designated as well-recognized in the surgeon general's office will be permitted to make application for the establishment of the Students' Army Training Corps Unit for men between eighteen and twenty-one years of age who desire to study dentistry, and each school was advised as to the number they would be permitted to enroll.

The decision has not yet been reached by the War Department as to whether or not students who are enlisted in the medical enlisted reserve corps will be immediately transferred to the Students'

Army Training Corps, but said decision will be soon forthcoming.

A military director is to be placed in charge at each dental school.

All students in the Students' Army Training Corps to be furnished all clothing without expense, and tuition to be paid by the Government, and to receive pay of \$30.00 a month. Quarters consisting of barracks or suitable buildings that can be transformed to the purpose intended to be constructed or rented by the school officials and approved by the Government's representative, and to house such students in a single group of buildings or barracks. All study and recreation hours to be under military supervision. Each school must secure drill grounds in close proximity, as these students must receive not less than six hours a week of military drill.

Examinations will be given every three months in military and professional subjects, and those who fall below an established grade will be dropped from the professional training and sent to camp for general military service. In so far as it is possible to do so, students in the Students' Army Training Corps will live under exactly the same military discipline as all other enlisted men live in the various camps.

It is assumed that there will be no vacation period for the dental students belonging to the Students' Army Training Corps. However, it is possible that the professional instruction may not be continuous, as all such students may be taken to camps for more extensive general military training during a portion of the usual summer vacation period. Still, it may be found necessary, in spite of this intensive training, to consume more than thirty-two teaching weeks to cover the normal professional course to make up for the time given over to military drill and military lectures. This will likely be true in those years which are occupied with laboratory and infirmary work.

Male students who are physically unfit for military service and foreign students who desire to do so may purchase their own uniforms and receive the military training without additional expense beyond that referred to. Army cots, blankets and rifles will be furnished by the Government and sent to each school.

THE EDITOR'S DESK.

THE OLD HOME.

The other day I passed the old home where I was born. I went in that unique and ancient conveyance a horse and buggy, and the experience was novel. The distance was only a few miles but the time seemed interminable. How slowly those great thin buggy wheels revolved, and how primitive the horse looked as he joggled along. In one way it was soothing, leisurely and comfortable; in another it was almost unbearable in its seeming waste of time. In one way it was the obvious and natural, in another it was horribly grotesque and strained.

One moment I found myself relaxing and looking reminiscently over the familiar objects along the roadside, the next I was keyed up with a frantic desire to press my foot on the accelerator and skim blithely over the ground. It was a mixed experience—an attempt to blend the old with the new, and make them harmonize. Never in all human history has there been so rapid and complete a transition as there has been from the horse-drawn vehicle to the automobile, and the wrench is not all out of the situation yet. It is punishment now to attempt a long journey in the country without an automobile, and yet I found myself a short time ago looking with longing eyes at a beautiful horse. The world will never be quite the same to those of us who have loved horses as it was before, and yet which one of us would go back to the days before the automobile? It is merely a readjustment with the old not quite forgotten, and the new not quite mellowed down and reconciled.

The old house has stood there for more than sixty years, and it begins to look the part it has played. Some of the shingles are missing, and there is not a vestige of paint left on the exterior. It is weather beaten, and leaning a bit out of plumb. I am sure that a loose board here and there must rattle in the wind, and the tall grass has grown up in front of the door-way.

The path leading from the house to the little gate is obliterated, and, worse than all, the splendid trees on either side of the gate have been ruthlessly slaughtered, because forsooth they shaded the ground and were charged with preventing the full

yield of the land. Had I been favored with the emotions of a woman I should have wept at the barrenness left by the loss of those dear old trees. The man who did it was a practical man, and I suppose I should not complain because he fits so perfectly into the spirit of the age. And yet to me it seemed almost sacrilege to cut down those superb and towering trees that had waved their banners so bravely for half a century or more. It is only typical of the tendency which sacrifices the traditions and sentiments of the past for the seeming necessities and utilities of the present.

The old home is untenanted today save by the hallowed memories which linger and echo within its walls. How I wanted to open the side door and go browsing around among the familiar rooms, how I wanted to climb the stairs and look out the east window where the old manse used to be and then walk across the chamber and look out the west window. But the doors were locked and the keys were held by an alien hand—the old house had “gone out of the family.”

As I drove away I fell to dreaming—dreaming of other days before life became serious and when the problems were all in the future. I dreamed of lightness and laughter, of the crackle of wood fire, and the hum of many voices. I dreamed of the patter of raindrops on the roof in summer and the swirl of snow along the eaves in winter. I dreamed of warmth and cheer inside, and the jingle of sleighbells out of doors. I dreamed of the beaten path to the barn, and the odor of new mown hay in the loft. I dreamed of the maple bush where in early spring I was cradled in a bucket made for sap. I dreamed of the long autumn nights, and the glorious sun-sets over winter snows. I dreamed of the old manse down the road, whose massive bulk looms large in my boyhood's mind.

But gone is the manse, gone the maple bush, gone the flowers which flecked the yard save a few stray patriarchs forcing their persistent heads among the rank grass, gone the life and gayety of the place, and nothing left save a subdued and tender memory. Gone also are some of the old familiar faces who brightened the days of the long ago—gone where the summer sun beats down, and the winter snow piles up over the mounds in the little white village on the hill.

BOOK REVIEWS.

PRINCIPLES AND PRACTICE OF FILLING TEETH, By C. N. Johnson, M. A., L. D. S., D. D. S., Fourth Edition. Revised and enlarged. 282 pp. Price \$3.00. P. Blakiston's Son's Co., Phila.

The fourth edition of this standard treatise upon the subject of Operative Dentistry is just off the press, and, in keeping with former editions, is in every way all that could be expected from the pen of this premier writer and teacher.

The entire subject of operative dentistry is presented in such lucid manner and in such systematic and sequential order as to make it easy for the student to grasp the principles underlying the preservation and restoration of the teeth of the human family by all of the recognized and established methods and procedures, and the classification and arrangement is so well and so thoroughly treated as to make the teaching of this important subject easy even for the teacher.

Indeed, a teacher could not well do better than to accept the teachings and present the subject to his students in precisely the order and manner outlined in this book, and many will doubtless avail themselves of the opportunity. The concise and practical manner in which the author presents the entire subject of operative dentistry causes one to wonder how such ponderous volumes could previously have been written upon the same subject.

The chapter on "Cast Inlays" has been rewritten, and this important subject is now so well presented and so adequately illustrated as to do credit to both subject and author.

While any possible criticism of any statements made would be indelicate and presumptuous on the part of the writer, yet it is to be regretted that the author should see fit to intimate that the principles of cast inlay fillings "are not yet well standardized." In this connection it is the opinion of the writer that if these fundamental principles are not yet well standardized, the fault lies with the operator, rather than with the principles, and is due to the inerrjection of the personal equasion into the interpretation and execution of the technique, by the individual operator rather than to varying, inadequate or faulty principles.

This opinion is held for the reason that the technique of Dr. Taggart has never been changed by him since he first gave the

cast inlay to the profession, and that no appreciable improvement upon this technique has yet been made by anyone else.

Hence if these original teachings are closely followed, and if all details are carefully and uniformly observed in all cases, the writer believes that standardization is possible, and that it was a part of the original scheme from its inception. And he further believes that just in proportion as these details in the composite are so observed, in the same proportion will failures in casting decrease and the possible accuracy of adaptation increase to such a point as to result in castings the cavity surface of which will not have to be touched with instrument, stone or disk, or otherwise altered, before mounting, and as will thereby insure standardization.

The chapter on Radiography and Root-Canal work stands out conspicuously as a masterpiece of practicability and conservatism along these lines, and, just at this period when the professions of both medicine and dentistry are at the very border-line of dangerous overenthusiasm with regard to focal infection, and general systemic disturbances arising from the retention of pulpless teeth, with the result that countless teeth which could doubtless be made healthy, useful and comfortable for years are being ruthlessly destroyed, patients made prematurely old and compelled to go through life with an impaired masticatory apparatus, thereby such a chapter is most timely.

Indeed the writer earnestly wishes that every practicing physician, every dental radiographer and every dentist might not only have access to a copy of this chapter, but also be compelled to read it.

On the whole the author and the publishers are to be congratulated and the profession should feel no small amount of pride in the addition of the Fourth Edition of *Principles and Practice of Filling Teeth* to its standard modern literature.

HART J. GOSLEE.

PRACTICAL HINTS

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Caring for Saliva Ejectors:—Keep a goodly supply of saliva ejectors of various sizes immersed in a 10 per cent solution of hydrochloric acid. Have assistant change ejectors after patient is in chair.—“C.”

Management of Infection and Inflammation Resulting from Gum Tissue Overlying the Occlusal Surface of Lower Third Molars:—Place a small, tightly rolled, pellet of cotton, moistened in eugenol or dentalone, beneath the flap of gum tissue. This will establish free drainage and relieve the pain. At the next sitting the tissue may be anesthetized and removed without danger of spreading the inflammation.—*A. S. Bensend, Carthage, S. D.*

Relieving Pain of Devitalizing Pulp:—When a patient returns to the office with an aching tooth as the result of a treatment for devitalization, conductive anaesthesia may be used with good results. If properly performed the aching subsides in a few minutes, after which the tooth may be thoroughly and painlessly opened up. A new treatment can then be placed in the tooth, or if sufficient anaesthesia is present, the pulp can be removed at once. In either instance, a patient relieved of pain will leave the office.—*Albert E. Converse, Springfield, Ill.*

Connections for Vulcanizer:—Rubber tubing used to connect the vulcanizer soon becomes defective and allows the gas to escape; in place of it use small brass or copper tubing such as is used on automobiles, connecting to bunsen burner and gas regulator with union couplings which are easily loosened. If a clock is used for timing and it is necessary to shake the clock to start it, instead of shaking it cut a small hole in the back of the clock case opposite the escapement, then by simply touching the escapement with an instrument the clock may be started.—*Edward T. Evans, Decatur, Ill.*

Removing Gold Inlay Without Endangering Tooth or Inlay:

—Drill a hole in the inlay at the logical point, of a proper size to engage moderately a small slender screw elevator (Morrison screw porte, No. 1, No. 2 and No. 3).

Insert the porte to fair degree of firmness, place small hickory stick or any convenient instrument in the "eye" of the porte for handle and pull steadily in proper direction.

The most complex and firmest inlays in teeth with weakest cavity walls can be removed with surprising ease and safety.

To repair the small opening made in the inlay requires very little time with bits of solder and blowpipe.—*Clarence H. Wright, Chicago, Ill.*

Removing Bad Lateral Root:—An upper lateral root which the X-Ray showed to be infected as well as crooked, absolutely resisted all usual methods of removal.

At a hardware store a very small "Machine Screw Tap" was purchased, also one or two short machine screws to fit the thread which this screw would cut. With a large fissure burr the canal was carefully enlarged and a *real* screw thread carefully cut in the sound dentin of the tooth. The tap was then removed and one of the machine screws firmly set up tight in this threaded root. The protruding head of the screw offered a splendid hold for the ordinary forceps and the root came out entire and without fracture. (The ordinary hybrid tools supplied by dental manufacturers for doing this sort of work do not cut a *real* thread in the root, also they are so brittle on the end as to be in great danger of snapping off under the strain of a heavy pull.)—*Arthur G. Smith, Peoria, Ill.*

A Plaster Bite for Bridge Work:—In constructing bridge work, it is often difficult to transfer crowns or attachments from the abutment teeth to a working model, with certainty as to maintaining their proper position and relation throughout the procedure. For small or moderate sized bridges, a plaster bite taken as follows, will be found efficient and reliable for this purpose:

With crowns or attachments securely and accurately in position upon the abutment teeth, mix plaster moderately stiff and with a suitable spatula, apply generously over abutments and surrounding tissues which are necessary to be reproduced in the model and have patient bite the opposing teeth to place.

When plaster has set, remove bite and replace attachments in impression. If attachments pull off in the bite, be sure to press them firmly back into position and secure with hard wax before running up the model.

In some cases it may be necessary to split the plaster to remove the bite, but this is generally of little consequence, as the plaster can easily be pieced together with hard wax.

The advantages of this method are, certainty of maintaining proper position and relation of attachments, and at the same time, obtaining an accurate impression of the opposing teeth.

If that portion of the bite which contains the impression of the opposing teeth, is run up in some hard model material such as Weinstein's Artificial Stone, or Spence compound, it will be an advantage, for when plaster is used, this portion of the model is often rendered useless by abrasion or breakage.—*C. W. Coltrin, Chicago, Ill.*

MEMORANDA.

NORTHERN ILLINOIS DENTAL SOCIETY.

The Northern Illinois Dental Society will hold its meeting at Joliet, October 9th and 10th, 1918. A fine program and clinic is assured. Mark off time now and plan to attend. *E. L. GRIFFITH, Secretary, Freeport, Illinois.*

DENTAL EXAMINATION IN ILLINOIS.

The next meeting of the Committee of Dental Examiners for the examination of applicants for licenses to practice dentistry in Illinois will be held in Chicago, the week commencing Monday, October 28. For application and further information, address the Department of Registration and Education, Springfield, Illinois.

*F. C. DODDS,
Superintendent of Registration.*

DEPARTMENT OF REGISTRATION AND EDUCATION.

Dr. C. N. Johnson, Editor,

THE DENTAL REVIEW,

810 Masonic Temple, Chicago, Illinois.

Dear Sir—As you doubtless know, the Department of Registration and Education of the State of Illinois has succeeded to the rights, powers and duties vested by law in the late State Board of Dental Examiners.

The purely professional features of the dental law are in the hands of a committee, appointed from time to time by the director of the department for this particular purpose. All of the administrative features of the law are handled by the Department of Registration and Education.

In your next issue, I wish you would make it clear that all correspondence in regard to applications, examinations, etc., in Illinois should be addressed to the Department of Registration and Education, Springfield, Illinois. A great many letters are being addressed to Doctor Seifert, late secretary of the Board of Dental Examiners, and also to Doctor Ezra F. Hazell, who is the secretary of the examining committee of dentists in this state, and who has absolutely nothing to do with the administrative features of the law.

Yours respectfully,

*F. C. DODDS,
Superintendent of Registration.*

CLASSIFICATION OF DENTAL SCHOOLS AS ADOPTED BY THE DENTAL EDUCATIONAL
COUNCIL OF AMERICA, JULY 31, 1918.

CLASS A.

Creighton University, College of Dentistry, Omaha, Neb.
Harvard Dental School, Boston, Mass.
Marquette University, College of Dentistry, Milwaukee, Wis.
Medical College of Virginia, School of Dentistry, Richmond, Va.
North Pacific Dental College, Portland, Ore.
Ohio State University, College of Dentistry, Columbus, Ohio.
The Thomas W. Evans Museum and Dental Institute, University of
Pennsylvania.

Tufts Dental College, Boston, Mass.
University of California, College of Dentistry, San Francisco, Cal.
University of Illinois, College of Dentistry, Chicago, Ill.
University of Iowa, College of Dentistry, Iowa City, Iowa.
University of Michigan, College of Dentistry, Ann Arbor, Mich.
University of Minnesota, College of Dentistry, Minneapolis, Minn.
University of Pittsburgh, College of Dentistry, Pittsburgh, Pa.
University of Southern California, College of Dentistry, Los Angeles, Cal.
Northwestern University Dental School, Chicago, Ill.

CLASS B.

Colorado College of Dental Surgery, Denver, Colo.
Georgetown University, School of Dentistry, Washington, D. C.
Howard University Dental School, Washington, D. C.
Atlanta-Southern Dental College, Atlanta, Ga.
Louisville University, College of Dentistry, Louisville, Ky.
Chicago College of Dental Surgery, Chicago, Ill.
Indiana Dental College, Indianapolis, Ind.
Loyola University, School of Dentistry, New Orleans, La.
Tulane University, School of Dentistry, New Orleans, La.
Baltimore College of Dental Surgery, Baltimore, Md.
University of Maryland, Dental Department, Baltimore, Md.
St. Louis University, College of Dentistry, St. Louis, Mo.
Washington University Dental School, St. Louis, Mo.
Kansas City Dental College, Kansas City, Mo.
Western Dental College, Kansas City, Mo.
University of Buffalo, Dental Department, Buffalo, N. Y.
New York College of Dentistry, New York.
College of Dental and Oral Surgery of New York.
Western Reserve University Dental School, Cleveland, Ohio.
Ohio College of Dental Surgery, Cincinnati, Ohio.
Philadelphia Dental College, Philadelphia, Pa.
Vanderbilt University, School of Dentistry, Nashville, Tenn.
University of Tennessee, College of Dentistry, Memphis, Tenn.
Meharry Dental College, Nashville, Tenn.
George Washington University Dental School, Washington, D. C.
College of Physicians and Surgeons, Dental Dept., San Francisco, Cal.
Baylor University Dental Department, Dallas, Texas.

CLASS C.

Lincoln Dental College, Lincoln, Neb.
College of Jersey City, Jersey City, N. J.
Cincinnati College of Dental Surgery, Cincinnati, Ohio.
Texas Dental College, Houston, Texas.

SIXTY-EIGHT VACANCIES IN THE DENTAL CORPS, THE UNITED STATES ARMY.

1. The acting surgeon general of the army announces that there are, at the present time, 68 vacancies in the dental corps, the United States army, and that examinations for the appointment of dental surgeons will be held at various points in the United States, on Monday, November 4, 1918.

2. Application blanks and full information concerning these examinations

can be procured by addressing "Surgeon General, U. S. Army, Washington, D. C."

3. The dental corps is a constituent part of the medical corps of the army, and consists of officers in the grades of colonels, lieutenant-colonels, majors, captains and first lieutenants. Appointments therein are made at the rate of 1 for each 1,000 of the total strength of the regular army, authorized from time to time by law. Law requires that first lieutenants of the dental corps shall serve five years in that grade before being promoted, but for the period of the existing emergency this provision has been suspended by act of Congress, and after one year's service as first lieutenant a dental surgeon is eligible for promotion to the grade of captain, after which promotions are made in order of seniority as vacancies occur in the higher grades.

4. No applicant may under existing law be commissioned in the dental corps unless he is between 21 and 32 years of age, a citizen of the United States, a graduate of a standard dental college, and of good moral character, nor unless he shall pass the usual physical examination required for appointment in the medical corps, and a professional examination which shall include tests of skill in practical dentistry and of proficiency in the usual subjects of a standard dental college course. Whether or not the applicant is married has no effect upon his eligibility for the dental corps.

5. Application for appointment must be made in writing to the surgeon general of the army, upon the prescribed blank form. All the interrogatories on the blank must be fully answered. In compliance with the instructions thereon, the application must be accompanied by testimonials, based upon personal acquaintance, from at least two reputable persons, as to the applicant's citizenship, character and habits.

The selection of the candidates is made by the surgeon general from the applications submitted, and a formal invitation to report for examination to the most convenient examining board in each case will be issued by him.

6. The examinations are conducted under instructions from the surgeon general and usually last six days. No allowance can be made for the expenses of applicants undergoing examination, whether incurred in travel to and from or during their stay at the place of examination, as public funds are not available for the payment of such expenses.

Each applicant, upon presenting himself to the board, will, prior to his physical examination, be required to submit his diploma as a graduate of a standard dental college. Should he fail to do so the examination will not proceed.

7. A first lieutenant receives \$2,000 per annum; a captain \$2,400 per annum; a major \$3,000 per annum. These salaries are increased by 10 per cent for each period of five years until the maximum of 40 per cent is reached, excepting that the maximum salary of a major is \$4,000 a year and that of a lieutenant colonel and colonel is \$375 and \$416.66 per month, respectively. In addition to their pay proper, they are furnished with a liberal allowance of quarters according to rank, either in kind, or where no suitable government building is available, by commutation. Fuel and light therefor are provided. When traveling on duty an officer receives mileage for the distance traveled. On change of station he is entitled to transportation of professional books, and papers and a reasonable amount of baggage at government expense. Groceries and other articles for their own use may be purchased from the quartermaster at about wholesale cost prices. Dental surgeons are entitled to medical attendance and hospital treatment without charge other than for subsistence.

8. Officers of the dental corps are entitled to the privilege of retirement after 40 years' service, or at any time for disability incurred in the line of duty. On attaining the age of 64, they are placed on the retired list by operation of law. Retired officers receive three-fourths of the pay of their rank (salary and increase) at the time of retirement.

9. In order to perfect all necessary arrangements for the examination, applications must be in the possession of the surgeon general at least two

weeks before the date of examination. Early attention is therefore enjoined upon the intending applicants.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS.

NOTES AND NEWS.

COMMUNICATION FROM THE PRESIDENT.

We are starting on our third year with the following officers elected at our annual meeting in Chicago on August 9, 1918:

President—J. W. Beach, Buffalo, N. Y.

Vice-President—J. D. Millikin, San Francisco, Cal.

Secretary—O. A. Oliver, Nashville, Tenn.

Treasurer—L. M. Waugh, New York, N. Y.

Representing the Surgeon-General's Office—Lieutenant J. V. Gentilly, New York, N. Y.

Director General—W. D. Tracy, New York, N. Y.

We deeply regret the resignation of Dr. C. F. Ash as director general, but activities in other directions made it imperative. He has been appointed a member of a committee for the conservation of platinum, an office which will occupy a large share of his time. His service as director general have been of inestimable value to his country and to the league and a more efficient incumbent could not have been found. I know every member joins me in these sentiments, together with good wishes and the hope of long service to his government.

The assurance given by Dr. Ash that his interests are with the league at all times, also that his services will be given just as freely as before, has somewhat mitigated the effect of his resignation, but nevertheless, we shall greatly miss his active management of so important an office as that which he so ably occupied.

THE NEW DIRECTOR GENERAL.

Dr. Tracy, our new director general, has been director for the Department of the Northeast as well as chairman of the New York unit of the league. He is, therefore, especially qualified to assume the broader duties, inasmuch as he has been, as it were, the understudy of Dr. Ash.

No better selection could have been made following Dr. Ash and it gives me great pleasure and satisfaction to indorse him in every particular. This step means for him great sacrifice, but he has offered himself willingly and gladly to this great service. Every worker of the league will receive fullest co-operation from his department and I know he will receive equal return from our members and the benefits of our work will continue to increase.

We have a great work before us, for the league is developing into a real public service institution. We have at present no less than eight distinct objects, each of which demands special service from our members. The league is in position to direct all members of the profession to give full service to the great cause in our own special field. We have no need to look elsewhere for work to do.

Let each one of our army of 18,000 members become an ardent, conscientious worker in the vineyard of humanity, for the success of the colors and the triumph of justice and right.

COLONEL LOGAN AND THE LEAGUE.

In his president's address before a great audience of more than 5,000 people in the Auditorium theater, Chicago, on the evening of August 6, last, Colonel Logan, as president of the National Dental Association, spoke in most appreciative terms of the service the members of the league have rendered in making the registrant dentally fit for military duties. We are deeply grateful for such expression, yet feel that our members are justly entitled to it. No one will ever know the amount of free service given by the dentists of America, not more than one-third of which will ever be recorded.

A suggestion was made by Colonel Logan that, inasmuch as the military camps are now well equipped, the army dental department is in a position

to do the necessary fillings for the recruit after entering the service; therefore, it is his desire that the league give special attention to reclaiming the dentally unfit in order to place them in Class A. By so doing, the dentist may render the greatest service to the government by augmenting our fighting forces.

This suggestion is both timely and needed, particularly as the draft age has been extended to include a vast army of men who will need fixed bridge-work to put them in the firing line. To do this means time, money and sacrifice for all of us, but we will do it without question or complaint. It is our duty and no right-thinking dentist can sidestep the issue.

Continue doing all necessary fillings and extractions as heretofore, for there is more dental work needed by our soldiers than could be done if every one of the 50,000 dentists of the United States should devote his whole time to this purpose. Shoulder the additional burden manfully and cheerfully for the sake of our own boys who are laying down their lives by the thousands that we may spend our declining years in our own peaceful country and under the protection of the flag that shall bring enduring democracy to the whole world.

Assure Colonel Logan of our co-operation in this way.

OUR STUDY COURSE.

One of the most urgent duties of the league is to make available a course in war oral and dental surgery for the civilian practitioner. We are exerting every effort to have it ready as soon as possible. Some delay has been caused by unavoidable circumstances, but league members may be sure no further delay will occur.—J. W. BEACH, President.

COMMUNICATION FROM DIRECTOR GENERAL TRACY.

While it is true that as the dental corps of the United States army increases in numbers and efficiency the need for volunteer services on the part of the Preparedness League in connection with filling operations will correspondingly be reduced, it is not intended that the activities of the league shall be curtailed in this respect at present, as the accession of men from the new draft will be greater, both as to numbers and rapidity of induction than heretofore. It is, on the contrary, absolutely necessary that greater impetus and effort be given to our work.

BRIDGEWORK.

It is also desirable that the scope of our work should be broadened to include the restoration of those registrants who are physically fit for general military service, and are held in Group C solely because of their dental deficiency.

A large percentage of these cases can be restored by the insertion of small bridges, thus bringing them up to the minimum dental requirements of six masticating teeth in occlusion, and six incisive teeth in occlusion. No extensive restorations by bridgework are contemplated. In other words, only those cases are recommended for treatment which can be brought up to minimum requirements by the insertion of a small and inexpensive bridge.

At present there is no government regulation compelling registrants in the class mentioned to have this work done at their own expense, and no provision exists making it possible for them to have this work done at the cantonments.

Most of the men mentioned above are anxious to be made dentally fit in order that they may be inducted into general military service and thus be of use to their country in the fighting line. I have found that with few exceptions the local boards, throughout the country, are very appreciative of the dental services which have been rendered to the registrants under their control, by the members of the Preparedness League of American Dentists, and I am sure if it is known that we have a large list of volunteer dentists who have offered to take cases of the type outlined above, a great number of registrants now standing in Group C can be restored and immediately transformed to Class 1-A.

It is, therefore, plainly the duty of every member to write to the league officer in charge of the work in his section notifying him that he will be glad

to take one, two or more cases each month, without expense to the registrant, the league or the government.

FAMILIES OF SOLDIERS.

Our activities should also embrace the care of dependent families of our soldiers, sailors and marines, who are unable to pay for dental services.

It has also been stated that one of the greatest possibilities for service on the part of the Preparedness League and its members would be a full and free co-operation between the league and the home service section of the Red Cross.

In many instances the wives and families of soldiers in the U. S. army who have been accustomed to private dental treatment, but who, because of the reduction in their incomes cannot now afford to go to a private practitioner, should be taken care of by the volunteer dentists of the Preparedness League.

The home service section of the Red Cross, through their authorized agents, will investigate each case as presented and in those cases recommended for dental treatment at the hands of the Preparedness League, the patient will receive a card bearing the endorsement of the Red Cross, stating that the patient is a member of a soldier's family and worthy of free dental treatment.

In this manner much suffering can be alleviated and much dental trouble prevented among the families of the men who have gone forward to defend our country.

The medical profession is already co-operating most generously with the home service section of the Red Cross and it is hoped that every member of the P. L. A. D. will share in this work.

This type of work has already been begun by a number of Preparedness League units in various states and the pleasure and satisfaction which the members are finding in taking care of these cases warrant us in believing that it can be extended to every state in the union.

Plans are now being formulated to take care of this new department in our activities and it is the intention of the officers of the league to have the work so arranged as to bring no special hardship on any one member.

While the allied forces are meeting with gratifying success at the front and ultimate victory is assured, this is no time for relaxation in any of our war activities or patriotic efforts and it is only by putting every ounce of human energy into action that the result desired by all truly civilized peoples can be attained.

As a national patriotic body of professional men we are strong and well organized, but in a few states the work has developed slowly and it is urged that in such states the directors and officers grasp anew the great possibilities of the league's work and take up with increased determination the duties they have assumed.

Assuring you of my desire to assist and co-operate with you in every possible manner, I am, yours very truly, W. D. TRACY, Director General for the United States.

COMMUNICATION FROM THE COMMITTEE ON MOTOR CARS FOR CAMPS.

The undersigned visited Camp Greenleaf this summer. Camp Greenleaf adjoins Fort Oglethorpe, Ga., and is some six or eight miles from Chattanooga, Tenn. Here are situated training schools for medical men, dentists and others. It is with the dental training school, of course, that we are most interested. The writer quickly discovered that the dental corps at each military camp is sadly in need of means of rapid transportation about the camp, and to the neighboring city. Military camps accommodate from 25,000 to 75,000 men. Cities of that size would have trolley cars, cabs and other means of transportation. Moreover, there would be numerous shops. At a military camp there is but one place for procuring any needed article, and all such places are widely scattered. It is manifest that an automobile would greatly add to the efficiency of the dental corps at each camp by saving time that would otherwise be expended in walking great distances. This is so true that many officers have purchased second-hand Ford or Dodge cars, but these being private property must be maintained at the officer's individual

expense. Bills for gasoline, tires, repairs, etc., etc., make large holes in an officer's pay check. This seems hardly fair.

The writer, therefore, conceived the idea that the Preparedness League should procure a car for Camp Greenleaf. On his return to New York he reported this to Director General Ash, and was surprised to learn that a visit to Camp Upton had impressed Dr. Ash with the same need, and he was just inaugurating a campaign for obtaining funds for that purpose. The writer was then appointed chairman of a committee to foster this movement. Drs. Ash and Tracy sent out a circular appeal to the dental profession in New York, and through the generous response that resulted a Dodge car has been presented to the dental officers at Camp Upton.

The writer sent out a circular letter to one hundred men throughout the country asking for contributions to a fund to purchase a car for Camp Greenleaf. Before replies could have been expected to come in, the meeting of the American Society of Orthodontists convened in Chicago, and Dr. F. M. Casto, secretary of that society, and an officer in the league, suggested that an appeal be made in open meeting for contributions. This was done, with a response that redounds to the credit, loyalty and generosity of the members of that organization, not overlooking a few guests who were present. One thousand, one hundred and thirty-one dollars was subscribed and paid in just 38 minutes. A Dodge touring car was purchased by telegraph from a firm in Chattanooga, and was promptly delivered and is in use at the camp. A quotation from a letter of thanks received from one of the dental officers places an aspect upon this work which is important. It is as follows:

"When the high officers of the camp see our car, and when the instructors in the Sanitary, Cardio-vascular, T. B., X-ray, Orthopedic and other schools see it they know that the members of our profession are backing us for all they are worth and that we mean business. All such things serve to drive dentistry higher and higher in the estimation of the men around us and through these things, to stimulate us, we hope, to drive so hard that some day when the old standards of dentistry emerge from the war clouds, their colors will be flying high and Uncle Sam and the whole world will turn to our profession and say, 'Well done, good and faithful servants.'"

FUTURE EFFORTS.

The League may not be able to supply cars for all the military camps, but we are undertaking to furnish cars for at least ten more. We are at the moment of preparing this for publication awaiting the decision of the authorities as to which camps are most in need, whereupon the campaign will be pushed. It may be announced, however, that as soon as these camps are selected, the State Directors will be advised and asked to co-operate in collecting funds towards the car for the nearest camp.

After paying for the two cars already purchased and delivered, we are pleased to report that we already have a goodly sum left in the treasury of this fund.

Very truly,

R. OTTOLENGUI,

Chairman, Committee on Motor Cars for Camps.

OBITUARY.

WOOLEY, JEFFERSON HENRY.

Born Philadelphia, Pa., August 4, 1838, died in Chicago, August 27, 1918. Educated private and public schools of Philadelphia, San Francisco and Sacramento, Cal.; married in Coldwater, Mich., December 29, 1868, to Celia Parker. Was student in dentistry in Sacramento, 1854-6, San Francisco, 1856-60, practiced at Washington, D. C., and San Francisco, 1860-4, then at Coldwater, Mich.; came to Chicago, 1876; retired from practice 1917. Member of National, Illinois State and Chicago Dental Societies, Odontological Society, etc. Republican, Mason (K. T.). Funeral services conducted by Knights Templar.

The following dentists were in attendance: Drs. Edmund Noyes; J. G. Reid, E. A. Royce, Chas P. Pruyn, F. B. Ullery, L. L. Davis, F. E. Roach and Geo. N. West.

G. N. W.

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STAND PAT.*

BY DR. DONALD MAC KAY GALLIE, CHICAGO, ILL.

Mr. President, Dr. Thorpe, Ladies and Gentlemen:

I am, indeed, pleased to be here on this occasion. When I heard today some criticism upon the selection of this town as your place of meeting, I felt such criticism a mistake. It may be a little inconvenient to some of you, as a place for a dental meeting, yet I have but to cite that wonderful educational institution located here to justify the selection of this as a gathering place of educated and scientific men. Most of you dentists in common with a majority of the citizens of Missouri must appreciate the fact that the State University is an institution to which you can point with pride. I have had an opportunity, in the last three years, of visiting some twelve or fifteen university centers and of being conducted through the campus and halls of these great institutions, and I have not seen anything more beautiful than the splendid entrance and campus at the institution you have for the training of the boys and girls of the State of Missouri. Not only have you reason to be proud of your State University, but you also have reason to be proud of your other educational institutions. You have reason to be proud of your dental colleges, and perhaps not many of you know that but one state in the Union has as many such colleges. Your dental colleges average high, as, indeed, do all the schools in your state.

It affords me much pleasure to be the guest of the Missouri State Dental Association. During your fifty-three years of existence you have accomplished a wonderful work in behalf of dentistry. It is only necessary to recall the progress that has been made through the efforts of such men as Peebles, McKellops, Clark,

(*Address delivered before the Missouri State Dental Association, at a banquet held at Columbia, Mo., April 1st, 1918.)

Homer Judd, Eames and others, that great battalion in the little army of dentists in those early days; men skilled in their profession, whose work placed Missouri dentistry upon the map. They have left you a heritage which I believe you scarcely appreciate. There was no state in the Union that had a more brilliant galaxy of stars in the dental profession. Those men had vision. They saw the future of dentistry and were loyal to their calling. I wish we had more men of that caliber in the profession today. We have too many who are inclined to make excuses and apologies for the profession, as to what we have done, and what we are doing. We have no reason to make apologies or excuses, if we glance back three-quarters of a century to the time when dentistry was really made a profession, then consider its growth. I assure you we have a record that is surpassed by no profession in the world today. Just think, it was only in 1840 that the first dental college was organized, and the first dental journal and the first dental society were created. Think of what we have today—fifty-four dental colleges, most of them very creditable institutions, and now we have a dental Journal that goes to a larger percentage of the members of our profession than the accredited organ of any other body. The National Dental Association has gathered in a larger proportion of members of our profession than any other organization whether of commerce, finance or the trades. We have about 45,000 dentists in the United States, and I am proud to say that we have 24,000 members in the National Dental Association. The journal of our organization reaches dentists in the smallest towns and districts. So you can see what a tremendous influence this organization has.

It is true that from 1840 until a few years ago there was a tendency, from the very nature of our profession, to emphasize the line of reparative rather than preventive dentistry until we were brought up with a sudden jolt by Hunter's Indictment. This forced us to realize that we were neglecting the fundamentals, neglecting science and giving too much time to repair of damaged tissue and tooth structure instead of the work of prevention. We accepted that reprimand and immediately looked around for ways and means by which we could improve. We did not enjoy the advantages of our medical brothers for we had no internships, we had no post-graduate schools, no great institutions, like the Rockefeller and Carnegie, to work out our problems. State societies, singly and in

groups, started post-graduate courses. Study clubs sprang up in nearly every city and district and by the splendid contributions of societies and individuals we have well under way a Scientific Institution in Cleveland of which we may well be proud. The literature of the profession has made wonderful advancement in the past few years. No profession has made fewer mistakes than we have. We need not be downcast, because we are not succeeding in filling every root to the apex; we need not feel chagrined because we leave here and there some derelict in the jaw; don't be stampeded and alarmed by the radical demands of some of our medical brothers. There have, of course, been some radical alarmists in the past three years. Remember, they have made mistakes, and don't be scared by what is shown in the radiograph. You know they do not always portray the real conditions. Do not mistake me. I place a high value upon the use of the X-ray in the practice of dentistry. I could not get along without it, but I want to tell you it is the most discredited evidence in court today. It is conclusively demonstrated that lawyers can have a picture taken which is so distorted that it can be made to represent either side they want to have represented, so it is not always safe to follow it.

Again, I want to warn the society not to be carried off its feet by the extremists in the profession who tell us of the terrible things we are doing, and what we have to account for. Do the best you can. Be honest with yourselves and with your patients. Read the best literature; attend state societies, and your tri-state and national meetings, and when you have gathered in all that can be gained of the best practices, you know you are in a position to do the best that you are capable of, and you can stand pat. Be loyal to the profession, because you have no reason to make apologies; you have reason to be proud of it.

Today we find we have greater responsibilities than ever. More is expected of the dentists of today than ever. When the history of this great war is written, I believe one of the great achievements of the war will be the work of dentists in reclaiming and remaking the victims of the battle fields of these last three years.

In 1914, when this war broke out, it had not progressed one week before they realized the great necessity of dental service. The very nature of trench warfare resulting, as it has in so many head wounds, called for the services of skillful dentists. All of

you are familiar with the wonderful work of Hayes, Davenport and that coterie of American dentists in Europe and the great work of the British and French dentists, although there were not enough of them. You know when the cry came: "We must have more dentists," our brothers from Canada one hundred and eighty-five strong, went across in one body. Really the Canadian Association, more than any other, is responsible for showing to the world that this war could not go on without the aid of the dental profession. I know something about the records those men made. A dental friend from Toronto left with the first contingent, and in that land of pestilence and treachery, Saloniki, he lived for two years and only recently returned invalided. He told me of the work of the Canadian dentists in that land where the conditions were so conducive to deplorable oral conditions, and as to the manner in which they were treated. I have kept in touch with the British and Canadian journals regarding the work done by these men in every part of the world. We must never forget the devotion and sacrifices of these men. In a report made by a leading British general to the War Department and the Medical Department, he stated that no class of men in the service were entitled to greater credit than the Canadian Dental Corps. Our men, since they entered the service, have continued this great work. You know how we worked with Congress with reference to the need of dentists in the army and navy and only succeeded in securing a very few appointments. But since the United States entered the war, and knowing by reports the great need of dental services with our forces, an S. O. S. was sent out to dentists to join the army. There was a hurried gathering of a few prominent members of our profession at Washington, and ways and means started to get men to take up this great work. It was doubtful at first whether a sufficient number would respond. When the call was made, men over thirty-one did not respond. It was the young man who had been out of college a few years. You now hear some criticism of too many young fellows receiving commissions. This criticism is not just. I want to assure you that the great majority of the men who have received their commissions are high-class young men and are doing wonderfully efficient work. Some members of the corps have made great sacrifices. One man in particular, W. H. G. Logan, of whom I wish to speak, is known to a great many of you. I would not

mention his name or bring up this subject, were it not for the fact that it is necessary for us to stand back of him; because there is the most damnable and contemptible agitation started to discredit the dental corps and the dental profession generally, simply to get back at this man, notwithstanding the great work he has done and the great success that has already been achieved.

He was one of a number of dentists who were called to Washington by the National Council of Defense. In the discussions on the question of dentists in the army, his knowledge of the conditions and resources of our profession led to his appointment as one of the two dentists on the Medical Board. His chairman and associate was Dr. Edward C. Kirk. Closely following these appointments, Dr. Kirk gave up his work in the Dental Department of the University of Pennsylvania and became a prominent official in the S. S. White Dental Manufacturing Company and he resigned as a member of the Dental Committee of the Medical Board of the National Council of Defense and Dr. W. H. G. Logan of Chicago succeeded him. Dr. Logan possesses every qualification for this work. He is an excellent teacher, has few peers as an oral surgeon and pathologist and has no equal in organizing and executive ability. He was ordered to take his place in the surgeon general's office and organize the dental profession for war service. For three months he worked as a civilian. As oral surgeon in Base Hospital Unit No. II, he had the rank of captain before going to the capital. It soon became evident that his usefulness in Washington could be increased by accepting rank, and by order of his superior officers he was made a major. He received this rank because he had the M. D. degree, as you know the D. D. S. degree at that time did not admit of rank beyond first lieutenant. Only a few days ago Surgeon General Gorgas, in an earnest plea before Congress for higher rank for medical and dental men, made the statement that a man's usefulness in the Medical Department was increased in ratio to his rank. Dr. Logan, of course, accepted the rank of major. What else could he do? And so well has he filled the office that only a few days ago he was promoted to the rank of lieutenant colonel. (Applause.)

As soon as he received higher rank, there was spread throughout this country the most contemptible and damnable propaganda imaginable. I know that men in this audience have received letters

asking them to write to Washington and requesting them to get their friends to write also, to discredit Logan and demand that the surgeon general's department should have a man representing the dental profession who had a rank available to a dentist, which was at that time lieutenant. No attention was paid by the department, because the services of Dr. Logan were appreciated. I know that Col. Logan would not approve of my frank speech here. It has not been prompted by him, neither has he complained to me of these things; I had to get my information elsewhere, and I feel compelled to make the statement because I know what I am talking about, and believe that the profession generally should know the facts.

In furtherance of this propaganda, one of the first things done was the flooding of Washington and the country generally with requests to send in protests to Congress and the Medical Department against the Preparedness League of American Dentists, because it was said it was the political creature of Logan. Logan had nothing to do with the creation of the Preparedness League. It was organized before Logan ever went to Washington, and he had nothing to do with it. And let me say we should all be proud of the league. Then other scandalous protests were sent in, but the climax was reached when a prominent dental manufacturer, backed up by a few disgruntled members of the dental profession who were looking for office and promotion, inaugurated another attack and sent it broadcast throughout this country, requesting members to write to Washington and introduce resolutions at every state society, and at every gathering of dentists throughout the country, protesting against the retention of Lieutenant Colonel Logan as the head of the Dental Corps.

The men responsible for this dirty work are known in Washington and they are warned that if this thing continues they will go down to everlasting disgrace.

I attended the dedication of the Dental Department of the University of Iowa sometime since, and one of the first things I heard from a prominent member of the profession there was that the Dental Corps at the camps were a disgrace to the profession. I made it my business that day to interview fourteen of our boys from Camp Dodge—two of them majors and two captains—and they were unanimous in saying that no department today in their camp

was better conducted and doing better work than the Dental Corps. I have been to the Camp at Rockford, and the thirty-five officers they have there are as fine a lot of young men and operators as you will find in any section of the country.

Last Saturday, in Chicago, we had a report from men who had come from different sections of the country, to a conference of the officers of the National Dental Association. These reports related to the work at the different camps. Dr. Hinman of Atlanta, Georgia, had stopped off at Camp Greenleaf, and there, you know, they have a great Military Dental School, with 170 men in attendance, eighty-five going in and eighty-five going out each month; it is a sort of clearing house for the members of the Corps, and they are going to find out soon who the weak ones are. Dr. Hinman was very enthusiastic over what he had seen there. You have perhaps seen in the papers that in the Medical Reserve Corps there have been sixteen hundred men sent home for one reason or another—some for physical defects and some for professional disabilities. So, when you see occasionally a report of one of our dental boys being sent home, you need not feel that it is a disgrace to the profession—it only means that he is not quite fit for that strenuous line of work.

There is a great deal being said about the number of men that will eventually compose the Dental Corps. I think I can safely state that instead of having one man to one thousand in the army, they hope to have one to each seven hundred and fifty, so that when the soldiers go abroad, there will be 31 dentists provided for each division of 27,000. In a short time inspectors with the rank of major will visit the various camps. They will be selected from the best dentists in the country, and these men will make reports to the surgeon general's office. Some of our best men will be appointed for service at the Divisional Headquarters, so that the officers of the army will have service of the highest class. You can see the progress we have made. You can appreciate the standing we have obtained and the esteem and confidence we have secured with the officials at Washington.

What I ask of you is to STAND PAT. Be loyal to the men representing us in the army. You know what is expected of them. They will be subjected to so many hardships. It is true some of our boys will not be on the firing line; it may be some of

them will be stationed in billets far back; some will be in the base and evacuation hospitals, but many of them will be subjected to all the dangers and hazards that confront the men on the battle front.

When I think of them I am always reminded of an incident that occurred when the war broke out. Mrs. Gallie and I were visiting in Winnipeg. Troops were leaving for the front every day. This day we were watching a Highland Regiment led by a pipe band. The stalwart Scots swung down the streets looking neither to the left nor right, their kits swinging in rhythm with the pipes. A dear old lady standing next to me must have seen one dear to her, for she cried out, "God bless you, laddie! You may no come back again, but I ken ye'll gie a guid account of yoursel'."

Our boys have left their practices and their homes willing to go to the front in any capacity they may be placed. I know that many of them will not come back, but they will give a good account of themselves. It is up to you and to me to see they are supported in every way. You must STAND PAT, and be loyal to those boys. (Applause.)

But what about us who are around this banquet board tonight? What is our responsibility? Are we to be satisfied by sending these young men to the front? Not by any means. What part are we to play in this terrible convulsion that threatens to overthrow civilization? This is not only a war, it is the culmination of the greatest conspiracy that was ever conceived in the history of the world. It is a conspiracy, starting with the dream, and idea or scheme of one, and it has gone on in its development until it has included the aristocracy, the nobility, the philosophers and teachers, until today it has gone through a whole nation, and we now behold a nation obsessed with the idea that they are supermen and that they are called upon by Divine Providence to rule and regulate the world. How little most of us know about the real cause and reason for this war! We hear it is a contest arising through trade jealousy; that it is a war of Democracy against Autocracy, which is undoubtedly true, for we find lined up on one side nations that believe in freedom, in human liberty and in self-government. These people threw off the shackles of tyranny at Runnymede when King John signed the Magna Charta and Democracy had its birth. On the other side we find nations allied that stand and fight for just the

opposite. This great conspiracy for world domination started with the founder of the present German dynasty and has gone on gathering strength ever since.

Those of you who have followed the history of this war closely and have gone back to the real causes, can see the development of this idea. How Germany kept grabbing this and that territory and incorporating it into the empire. It is within our memory that this idea of domination was proclaimed by Bismarck, and the great military leader, Von Moltke, who said: "It is going too slowly, we must use force! Might is Right!" You know what they did. They dominated Austria and Hungary. They took from Denmark Schleswig-Holstein; then, about 1870, they picked a quarrel with France, and after France was defeated, they took from her Alsace and Lorraine, together with that great indemnity of billions of dollars, and after France had paid off that great debt in a short time, then Bismarck tried his best to pick another quarrel and is quoted as saying: "When we go back to France, we will leave her nothing but the eyes of her people for the tears to fall from." They have advanced this conspiracy in the last forty years by establishing a great military scheme, making every man and boy a soldier imbued with this idea of conquest.

A friend of mine residing in Charlottenburg was in a little book store making a purchase, when a German regiment goose-stepped by. He turned to the little spectacled book-seller and said, "Don't you get tired of this? Aren't you sick of paying taxes to keep up this military scheme?" The little fellow swelled up and said: "That is nothing; the tramp of those feet some day will be heard around the world!" That is just what every man, woman and child in Germany believes. The tramp of those feet would be heard around the world. They have inspired every ambassador, every consul, every commercial agent or traveler, every learned man to do everything in their power to bring about chaos and to undermine the strength of those countries to which you were assigned or in which they happened to be. I heard Prof. Schofield, of Harvard University, speak the other night. He was appointed third exchange professor from Harvard with the University of Berlin. He gave a description of the time he was in Berlin and told of the conversations he had with the kaiser. I believe the first question the kaiser asked was, "When will America find it necessary to adopt con-

scription and compel all men of proper age to undergo military service?" He described to Prof. Schofield the invasion of Russia and France exactly as the invasion has been going on the last four years. The kaiser said, "My country will never be invaded; I will compel peace when the time comes, but it will not be a peace of their making, but it will be a peace that I want, a peace my people will have." He described conditions eleven years ago, exactly as they exist today. So, I say, when this great conspiracy was ripe, this war started. It was not the intention to go on to the extent they have. They thought they had things arranged on account of their war machine, and their disregard for treaties, and that the war would be over in three months.

The assassination at Sarajevo was a mere incident. Germany was responsible for the unreasonable demands of Austria-Hungary against Servia. They knew that Russia would have to make some pretense of going to the rescue of the people of the Balkan States; but the history of the last year shows that, before the war, they had laid the foundation for the collapse of Russia, and they knew, after the war was under way a short time, that Russia would give in. They also knew that, with the entrance of Russia in the war, France, on account of treaty obligations, would have to come in, and it was France they were after. They wanted to go back to France so they could get the remainder of the coal fields and iron mines and forever crush her. This arrangement was beautifully made, but it was made upon the theory that Britain would not go into the war; but when Britain would not allow the rape of Belgium, it upset their calculations and instead of being a war of three months they could see that it was to be a war of long duration. Then what card did they play? Their next move was to introduce into warfare the most fiendish acts ever conceived—liquid fire, poisonous gas, air raids upon defenseless towns, the submarines destroying the lives and property of non-combatants, the sinking of hospital ships, polluting of the water supply, maiming children and ravishing women, and all that sort of thing. You know this murderous record was doubted by many up to the time our ambassadors, Mr. Girard and Brand Whitlock, and a few others of our people returned to this country. When these men told us what they had witnessed, we began to get our eyes open.

I was at a dinner sometime ago in the city of Chicago with a

number of representative men of that city and on account of being a countryman of the guest of the occasion, I sat near him. I heard what he had to say at that gathering, and I also was told by him of many things which he dared not speak of at that meeting. That man was Ralph Connor, chaplain of the 43rd Highlanders. He detailed these atrocities. My God! If only you could have heard them! Some of you perhaps have. I shall never forget the description he gave of what he had observed. He was with the Canadian forces, when they followed Hindenburg's retreat. He was only three days behind that retreat and, among other things, he mentioned their entry into a little town; not a spear of grass, not a single thing resembling life was left. Every tree was cut down, every stream polluted, every house wrecked or burned, every horse, cow, sheep and pig had been slaughtered, not a vestige of life, with the exception of one poor woman that came to the threshold of what had evidently been a brick house, with only three walls left standing. This young French woman told them that her husband had been killed four months previously and that when the Hindenburg army went through, they had broken in the door of their house with the butt ends of their rifles and demanded who was there. When she said, "Only my old father and my old mother," and the old man tottered out, over eighty years old, his brains were dashed out by one of those fiends, and his body left lying outside the door of that cottage; then they inquired where her mother was. She could not come out because she was bed-ridden. They scattered kerosene over the house and burned it down and that poor bed-ridden woman was burned in there. This sole survivor had no other place to go; she had been outraged and ravished by the Huns and was too weak to seek another asylum, and yet you hear people say they do not believe such things occurred! He told about this same Hindenburg army when they had made their advance and recounted an interview he had had only three days before he left France with the Bishop of "X," one of the grandest men in that section of the country. The bishop had a splendid parish, in which was located a convent and school with a fine corps of teachers. The bishop said: "Today we have nine living evidences of the lust of the bull-necked brutes who went through here only a few months ago. I heard this story. I know what Ralph Connor said was true. I have heard the story from others. I have heard of these atrocities

from some of my own relatives. I have a young nephew, an aviator, who has been on the western front for three years. Last June he was attacked by an enemy airman while he was giving aid to a companion, and at a height of 14,000 feet was shot clean through the body. He dropped 8,000 feet, recovered and succeeded in landing safely, but was unconscious when lifted out of his machine. He was mentioned in dispatches and granted thirty days leave for heroic conduct. He visited me in Chicago for two days. He told me of the awful conditions and the atrocities over there. So you see these reports are authentic and not exaggerated.

I have heard the story of Ada Ward, little Catharine Burke and Major Strobert. You can hear it from any of them. They have been there, and know all about the horrors. Those awful atrocities are what brought us into this war.

Now the question is what are we going to do? What is our duty at this time? We have people, and I know there are many of them in Chicago and also in Missouri, who are not loyal, and I tell you this is the time when we want to find out who is with us or against us. There are only two roads to go: You can only be for or against. You must be either loyal or a traitor, there is no neutral ground, and we want to find out where the people stand today. (Applause.)

When anyone says to you that they do not believe there have been such atrocities, or that such things ever happened or that such conditions exist, grab him by the throat and choke the lie out of his contemptible mouth, because he is a traitor, and knows he is lying!

You see in your papers every day the account of this fellow and that one being arrested for some disloyalty, some treasonable act; what do they do with them? Some of their fellow citizens round up one of those hounds and make him kiss the flag. They like to do that because they spit on it when they kiss it. It is time they should be made to bite the dust instead of kissing the flag. (Applause.) It is time we did away with sending these bull-necked brutes and sneaking spies, those treasonable hounds to watering places and pleasant resorts where they can continue to plot treason. The time has come when they ought to be shot instead of interning them in such places. My God! I would like to see more of them wither and rot, but from mistaken notions of humanity, we are in-

turning them instead of interring them. When we hear a disloyal word, or witness a disloyal act, we ourselves are disloyal if we do not report it. We, as dentists, are in a position to do the greatest good, because of our profession, we come in contact with all classes of people. We come in contact with the high and the low; the rich and the poor, and have a wonderful opportunity on account of our professional standing in our communities. So that more should be expected and done by us than by the ordinary citizen, and especially can we be useful in putting a silencer upon this peace talk, which is sporadically breaking out here and there. Only the other day I had a lady in my office, whose name did not sound as though she was a descendant of Washington, and she was talking about this terrible war, and our talk was becoming rather heated. At last she said, "I am glad my boy is not old enough to go to the war." I said, "Madam, so am I." "What do you mean?" I said, "Because that kind of breed is a liability to the country, instead of an asset," and she has left me for good! I tell you it is your duty to crush out this thing in every way you can. There are so many ways in which we can do our bit. There is no class in the world today more successful than dentists and less affected by the war. Let that soak in! One thing for us to do today is to prepare the boys so that they are fit to go to the front as far as oral conditions are concerned. This, you know, is being brought about by the Preparedness League of American Dentists. In spite of the protests which were forwarded to Washington, the department received the report of the Red Cross Association requesting or suggesting that the Government give the Preparedness organization financial aid, and they were given \$10,000 to start with. So you can be proud to do your part in this great work. You can be one of the efficient soldiers in this army caring for the mouths of our boys.

I hope every man here in the last month put in an honest income tax return. I learned the other day of a certain doctor in the city of Chicago who is reputed to have one of the finest equipped offices in the city and who pays \$1,500 a year rental, whose schedule filed with the revenue department showed that he was paying the magnificent tax of \$34.69. I reported him. You bet I did! He was falsifying, and cheating the government and by that was refusing to do his bit. The time has come for us to contribute to the loan soon to be called for. What are you going to do? No great

credit is due us for subscribing one, two or even five thousand dollars for this loan. It is a good investment. And yet, I have no doubt some hesitate. Our contributions, no matter how liberal, to the Red Cross, Y. M. C. A., K. of C. and all other kindred organizations are only a mite in this great struggle. Think of the contribution the fathers and mothers are making, and before this terrible war is over the greatest sacrifices must be made. We men think we have a heavy burden to carry but it is light compared to that of our women. But thank God! our women will never suffer like their sisters "over there." Think of the suffering of the women of France, Belgium, Poland and, worse still, go down to that Asiatic country where the Turk rules, and think of the Armenian women. A few nights ago I heard a noted American divine who recently returned from Turkey describe conditions in Armenia. He told of a terrible massacre that took place in one of the large cities just before he left. Every male, with the exception of a few cripples, was massacred. All the women, old and young, were herded together. All the Turks of military fitness in that section were in the army. Prisoners of all descriptions were liberated and sent to the front. So these women and children were placed in charge of degenerates, who were not fit to go into the Turkish army, and dispatched across the desert to Aleppo, a distance of eleven hundred miles. There were in that company eighteen hundred mothers, wives, daughters and sisters when they started on this journey, and when they reached Aleppo there were remaining alive but 154. They were old women and children, a great many died on the way, but the young women were taken from the ranks to a life a thousand times worse than death. This terrible pilgrimage, as well as the massacre, was countenanced by Germany, who is dictating all the atrocities and all the ruthlessness of this terrible conflict.

Recently I have been working for an Armenian student formerly of Roberts College. His family had been wiped out and he said to me one day, "Dr. Gallie, you Americans do not seem to understand what Armenian atrocities mean. You should remember that our mothers, wives and sisters are just like your mothers, wives and sisters, and yet little has been done by the world at large to prevent this extermination of a splendid race." Now, I ask you to think of the women of France. Their suffering has not been confined to this war period, but ever since 1870 they have lived in fear.

They knew that Germany was only waiting the chance to again attack. Across the frontier she could hear by day the pounding of the great trip-hammer and by night she could hear the roar and see the glare of the blast furnaces preparing instruments of war to subjugate fair France. No mother of France from that time could hold her baby boy to her breast and say, "You will grow up to be a great joy and support to me." No, no, she could only hold him closer to her heart and say, "You are a son of France. Some day you will have to fight and die that France may live."

Women of America, I know what you are going to do to help relieve the undescribable sufferings of those women over there; you are going to knit, sew, serve, save and sacrifice and pray that we may win this great conflict. You must not become discouraged or disheartened if at times we have reverses; you must not be impatient if the end of the war seems remote. Do not be carried away by every peace propaganda! Nothing is more disastrous than that. Only recently the whole land was flooded with peace talk. The wish was in every heart and the word on every tongue. The result was a tremendous let-up in war material production. A little Scotch friend of mine who has given his services for the past year to the Chicago Red Cross Chapter and had charge of the packing and shipping in the big warehouse there, told me that the shortage in production during that peace war was appalling. We are all longing for peace, my friends, but the only peace we can allow is a peace of our making. A peace that is possible only after we have beaten to their knees the murderous Prussian bully and his allies.

Few of you can feel as I do tonight, with the great uncertainty of the outcome of the terrible battle now raging. For nearly four years my people have been in this war. My old mother, eighty-seven years old, has seen since 1914 every male relative under forty-two go into the army—five grandsons and a dozen grand-nephews. From one family three sons have been killed. Others have been wounded and made prisoners.

Saturday evening, just two hours before I left Chicago to come to this meeting, my only son, who has been at Fort Sheridan since last August, received orders to proceed to Camp X to join his unit for overseas service and I had to leave my little wife to bear the brunt of parting with our boy, who left on Sunday. Ere many days your boys will be leaving for the front and you will

feel as I do—proud that you have sons going to fight for such a righteous cause. Think of that army on the west front, tonight, holding the line against great odds. Holding it until our reinforcements arrive; holding it because it means the surviving of civilization and liberty and the rights of humanity. While it may look dark tonight, in the end we will be victorious. (Applause.)

Shoulder to shoulder will stand the Briton, Scot, Celt, Gaul, Anzac, Canadian and American, inspired by the Red, White and Blue of spotless Old Glory, that has never been lowered in defeat; of the Tri-color of heroic France and the Union Jack, the flag that has braved a thousand years the battle and the breeze. Tonight let every lip say a prayer that reinforcements will arrive in time so that these flags shall not be lowered; so that liberty shall not perish! (Applause.)

DENTISTS' ASSETS AND LIABILITIES.*

BY DR. JOHN L. KIRBY, 59 EAST MADISON STREET, CHICAGO, ILL.

While Dr. Campbell has introduced me as being from Chicago, I can assure you I belong to the Southwest. If I lived in Chicago and practiced there a thousand years, I would still belong to Kansas, Missouri, Oklahoma, Colorado and Nebraska. I shall never lose my feeling of love, kindness and tenderness for the great big Southwest, and I hope when the undertaker gets ready to shoot his hypodermic in me he will at least send my ashes down here to scatter over the prairies of Kansas. I will feel more easy while living, if I know that my residue will be spread over the plains of the great Southwest.

I question if I would have appeared before this audience at the request of anyone but Dayton Campbell. I have done lots of talking over the country in one place or another, to the wives of the dentists as well as their husbands, and while it has given me a great deal of pleasure, I have found it to be too great a strain upon my nervous energy, and more of a strain on my time; so I entered into a compact with my wife a year ago to refrain for the rest of my days absolutely, yet you see I am at it again.

These are war times, and I have no moral right to take your

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time and my own to appear before you unless my message will help someone. I have talked to many dentists in the past five years, who have placed different values upon what I have had to say. I have expected that and expect it to-day. My reward has come in the expressions of gratitude that have been written to me by men all over the United States, saying I have helped them; that is all the reward I ask.

I am a dentist; I know all the griefs and woes of the dentists, can sympathize with them in their joys and sorrows and am interested in giving help to a brother dentist more than to anybody else in any other walk of life. Help does not always consist in material aid, and for that reason I am not making a special effort to come before the dentists with a plan to enrich them. There is a story told of a cultured man who lay in the gutter of a western city, soaked in alcohol; the Mexican bartender who had sold him his last drink in a sort of barbaric wantonness came by and kicked him in the ribs and, as if to add insult to injury, spit upon him. The "stew" opened his eyes but in his drunken stupor realized the insult that had been heaped upon him and at that moment came a *mental* kick to him that eventually led to a cure of the miserable habit. I have mentally kicked dentists until I feel sometimes afraid there will be a physical come-back.

I have been asked to talk to the wives, knowing that if you will carry a mental kick back to your husbands, as you can do, it can be landed with greater power and force, than I could give it to them myself. I have always admired Billy Sunday; not because of his gymnastics and rough talk but for his magnetism. I have seen him take a crowd of ten thousand people, abuse them, explain things to them and get a thousand of them to hit the sawdust trail. He gives them some mental kick that helps them to help themselves. You may say he is a good advertiser. He is. That he is a good salesman. He is a "cracker-jack" of a salesman. He can sell the Gospel, which is supposed to be free, to more people for more money than any man I ever saw. He is primarily courageous. He speaks a rough language because it is the rough language of the streets that is understood by you and me and everybody. I have been accused of sometimes being too rough; but I want to assure you, my good friends, when I cannot get the mental kick to the dentists any other way, I am going to do it that way.

I want to say at the outset, that the greatest asset a dentist has is his wife. I am a married man. They insinuate that men don't confess that away from home, but I want to be frank and admit that I am a married man and am glad of it; am glad I am married to the one I am married to, and my wife says the same thing, which shows her to be a very diplomatic woman. (Laughter.)

It has been said a married man lives longer than a single man. I can not speak with authority on that, because I have lived in single-ness longer than I have lived in harness and only time will prove in my case. It has also been said that a married man does not live longer, but that the time seems longer. Well, what more can he ask for even than that?

In these days of war taxes, when we have to go to the book-keepers to unravel our mixed accounts, or go to jail, it behooves us to quit guessing and to know what we really earn. I have heard many a dentist say in the past two months, "I have no record of what is to be deducted from my gross receipts, I will have to make a good guess and trust to luck." There are no good guesses, and guesses never bring luck and this is my fundamental reason for being here to-day. I want your husbands to quit guessing and to know what their assets are, and to know what return ought to be expected from these assets. I want to get them interested in that part of their practice that must not be mentioned above a whisper in a dental society—the business part of their office. There is a small per cent of the dentists in the land who need no encouragement about finances. They are primarily business men. I have a great respect for the profession, and would say nothing to bring dentistry in lower esteem. It does no good to fool ourselves. There are many men in the practice who are making a little pitiful salary, and among the young ones the deplorable fact is, they think they are getting rich. Possibly I am not talking to the dentists that I ought to be talking to as they most probably are not here.

The business man is king to-day, he gets what the other fellow wants, he has the money to pay for it. He is king, because he has a solution for every problem and admits no obstacle, his business organization and efficiency makes the impossible possible. He plans, he leads, he accomplishes, because he has the money to act. The professional man dreams; and hopes for the day that his wife does not fear the bill collectors. In a business sense he is classed by the

world at large with the widows and orphans and incompetents, because he is so busy with his own bills, he has forgotten to leave his wife money for the running expenses of the home. The dentist is a bad risk. The get rich concerns class him as a "fish"; when they have worthless stock to dispose of, they send their salesmen to try it on the dentist as well as the medical men. I suppose the ladies have the right to find out this, that the dental profession holds millions of dollars in worthless stock. It is a shame. They ought to have given it to their wives who could use it to good advantage in filling the household with better things.

To all appearances the dentist is a philanthropist. He gives his time, his eyesight, his health and earning ability to patients with no return for himself. At heart he should be a philanthropist; but he tells me he is not. He says he would "soak" his patients if he dared but is fearful his patients will leave him, yet all the time the patients think they are getting soaked anyway. He might as well have the game if he has the name. Is there a wife in the room, whose husband has longed for a post-graduate course and failed to get it because he felt he could not afford to spend the money for it? As a business asset the special courses pay even when the wife has had to exercise self denial for a time to help pay the bill. There are cases, where men have become discouraged in their work, thrown everything to the winds and started out on a career of professional prostitution. These men have not been successful and they have quit the calling in disgust. What is wrong with professional life? My answer is, the lack of cash. Not spasmodically, but almost all of the time. It is getting worse rather than better, and I am an optimist too. The laws of the business world must control the transactions of the dental office whether we want or no. If we refuse to gauge the action of these laws to our individual activities, we are fools and will pay the penalty, even if we cannot see why.

My next excuse for appealing to the dentist's wife for her help, is to draw the attention of the dentist to his office desk. He should pay as much attention to it as to the operating chair. The book-keeper of the dentist must be not only up to date, but should operate in 1918, with 1919 methods; instead of that he is using the business methods of a century ago. Ask any merchant if he can do business as he did ten or twenty years ago. He used to pile his clothing up on the table, ten or fifteen garments deep, and try to remember

who owed him money. He does it differently now. The farmer used to drive a team of oxen, or a pair of mules; he drives a tractor to-day, if he is successful and up to date. Accuracy in facts, records and efficiency in equipment is the rule in every department of life.

I would insist, as the wife of a dentist, that my husband should spend at least a half hour at his desk every day to study his business, not his profession; his fees, his costs, his collections, his "customers," not his "patients," and who they are, and why? How this month compares with the month a year ago, as a business man does all the time. Is he paying too much rent? Is he located in a correct part of the city? The United Cigar Stores have planned the location of every corner. They know within a few dollars of what one corner on a given street is worth as compared with another; they can tell you how much a rainy day will cut down sales on one corner as contrasted with another. They analyze those things and study them because it means dollars to them in the end. Is your husband's skill, as he grows older, being paid as any other skilled operator is being paid? Was he making ten dollars years ago, and now still making that ten dollars for the same service, or have his conditions in life changed? Does he use his accumulated knowledge of supplies worth using, or does he use the same old line of cheap "Made in Germany" goods that are not worth taking home? That half hour, he spends logically at his desk, may serve to make a losing day a profitable one.

How many dentists are really prosperous and making enough money so that they may save? The best answer is to be found in some of the supply dealers' records, noticing the C. O. D. selling accounts.

I have in mind a dentist in the city who has been practicing 30 or 35 years and whose name is well known over the country. I happened to get one of his patients the other day and I said to that patient: "He is a good dentist, why didn't you stay with him? I am not running you out of the office, mind you, as I need the business, but I have a curiosity to know why you did not stay with him?" The patient said, "I will tell you, why I didn't stay with him; he never pays any attention to his business and my time is too valuable to drag around after him and chase him to his office, yet I have been a patient of his for twenty years." There is one reason for some trouble with the dentist's earning power.

Who are getting larger fees than ten years ago? How much do you get for a gold crown? I ask this question with a smile because that has been a favorite question. I have picked some man in an audience in Kansas, Nebraska, Iowa, Wisconsin, Indiana, Illinois, and asked the price of a gold crown and the reply always struck me as funny. It would be \$8.00 every time, as if "8" had been constituted a lucky number instead of "7." I wonder if there are twenty-five dentists in the room who charge eight dollars for a gold crown? You are good sports and I won't ask you for a vote. Billy Sunday does not say "Hold up your hands," he says "Come up and hit the sawdust trail," and they proceed to hit it; and that is what I want you to do; if you charge eight dollars for a gold crown hit the trail and hit it hard and quick for more than eight dollars.

Living expenses have increased almost as fast as the overhead expenses. When I was first married, years ago, I owned a lot of fox-terriers. I would go to the butcher shop to buy a *dime's* worth of *porterhouse* steak. I would say to the butcher "*give* me a little dog meat; cut off a little piece of liver," and I got it. Today a half dollar's worth of liver would not feed one dog, and a man would be laughed out of a shop that would ask for a dime's worth of *porterhouse* steak.

Does the dentist know what his time is worth? Does he have any knowledge of his business, that the ordinary business man has about his? Why does he say \$8.00 or \$10.00 for a crown, or a dollar for an amalgam filling, or name any other price? Has he ever classified his skill? Some service is worth ten times what other service is; the paying ability of one patient is ten times that of another. I heard a dentist last night say, "I have a patient worth half a million; I have been getting \$7.00 for a gold crown, so I charged her \$7.00. I was an awful fool, wasn't I?" I said, "You surely were; that woman could easily afford to pay \$25.00 and there is no reason why she should not be charged that, or more."

I was talking to another dentist who came in for services. I knew him to be an advertising dentist, and in our conversation, he informed me that he had five thousand dollars in cash belonging to patients on accounts that had been started and the patients had either moved away, died, or neglected to come back; that sounded good to me, and I concluded to see if I could not get more money in advance

from my own patients. Most every dentist has \$5,000 in poor accounts in the course of 25 years' practice.

I am asking the dentist to forget that he is a professional man for awhile and study his office only as a business man every day for a short period of time. It is as important that the few thousands that he handles be as judiciously handled as the larger amounts by the big business man.

A lady came into the office with a woeful tale one day. She said her husband had been sick for a great many years—incidentally—it was her second husband. She was hard pressed and poor, and so, when I named a fee on a piece of work I felt those heart strings pulling at me, and cut the fee well down. I followed that woman to the street. She went to the coal dealer and said, "Send me down a ton of coal." He knew her poverty, but he sent her a ton of coal the same weight—the same price—that went to all his patrons. I followed her then to the grocery store, and she ordered a dollar's worth of sugar and took out a dollar and paid for it; and they sent to her the same amount as they sent to me a few moments afterwards for the same amount of money. It was brought home to me then, that I was the only chap in town that was sorry for her. Get over that sorry feeling! The services of the dentist are as worthwhile as fuel or food.

The dentist's feelings are constantly worked upon and while in that "squashy" condition, he is in no shape to name any fee. He should wait until a cooler moment and then name it.

Most of the work done by the dentists is done for women. Your husband is human, or he would not have married you. Now and then there comes in a matter of sentiment which is destructive of a good fee. Now, don't feel jealous. I am sure your husband is just as susceptible to the blandishments of the ladies, as I am. Don't blame him; love him all the more for being a good fellow. Let him adopt a system that is proof against such unbusinesslike methods. My solution for that friendly feeling is, to name the fee in advance before I get acquainted with the patient, if she be a new patient who presents herself. Another type is the important business man that intends to run his bluff on the dentist by making him feel how big and important he, the patient, is, and how he is going to send the dentist so much work, so that the dentist will gladly saw off a portion of the fee. Then there is the poor widow;

look out for her, and the poor working girl. Dentists somehow never feel sorry for the poor working man. There is a mental attitude in the dentist himself in trying to share the patient's burdens when the said patient does not ask for a share of such protection. There is only one insurance against this, that I have ever tried, that is the application of business methods to them all; when I see a patient wearing clothes my wife will not buy on account of the expense, I think of the \$10 or \$20 I should have added to that patient's bill.

Don't misunderstand me. In these war times when our heart strings are constantly being torn by the unfortunates, when our hearts and purses should be open as well; I am not pleading for selfishness, I am asking for a square deal. I believe that to-day I am doing more charitable work in dentistry than I ever did. I am trying to do it systematically and do the work I can afford to do. Do not permit some patient to come in, have work done and let him decide whether it should be a matter of charity. A man would be criminally foolish to give 25 per cent of his gross receipts to charity, when it took more than 75 per cent to run his business. He could not last long.

There are a lot of dentists who are too busy to make money. I believe that type of dentist is more frequently found in the cities than in the country. I have known many men of that character trying to take care of 25 to 40 patients a day. I would advise that they see fewer patients, get better fees and not work quite so hard. He should get a better assistant; use better business methods, as any good business man would do under the same circumstances.

Does your husband have spare time on his hands? Does he want to increase his earnings? Possibly he is not seeing all the work that comes to his office in the mouths of the patients that present themselves. Perhaps he is too sorry for his patient and doesn't want to put him or her to too much expense; then when that patient leaves the office they "blow" themselves because their dental bill was not as large as expected. He ought to cultivate the art of selling and make the patient appreciate the value of his work to his advantage in the matter of fees.

Dentists are too prone to overestimate their income; this is usually due to ignorance of their expense account or cost of conducting their business. Dentists are naming fees for services with-

out knowing what that service costs them. I know that, because the fees named are the same nearly as these dentists named for the same service twenty years ago. I will leave it to any dentist in the room if that isn't true. It costs surely more to render that service to-day than it did ten years ago.

There is another type of dentist that I find very common; that is, the men who can best afford to educate a community to paying living fees, are the very ones who are often responsible for keeping down such fees. Those men have an independent income outside of their profession.

Does your husband want more business and better fees? Then he must be equipped to render better service, and it devolves upon you to see he gets it. Thousands of children need orthodontic treatment which they cannot get, and they cannot get it because the local man says he doesn't like to practice orthodontia. Knowledge is not patented and held in trust by a corporation; yet that dentist has time to loaf in business hours, and time to study outside of business hours. He is either asleep, paralyzed or else he is lazy. If he is asleep, get him out to playing golf, get him out hiking. If you can't afford to join a golf club, there is nothing in the world like taking hikes. Have him sleep out of doors, and get plenty of fresh air; study his physical well being. If he is paralyzed, he is probably hopeless. He has got into a routine and he hasn't the mental power to tear himself loose. If he is lazy, it might be a good idea to have him join the army. Give him a mental kick. Tell him he has got it in him if he will only develop his talents. Have confidence in him, and if he is not a real slacker, he will make good. Believe in him, as you did when you married him, not because you know him so well, but if for no other reason that you improve your own condition. Be selfish about it; if he gives up, you will have to give up with him.

I have in my hand a bottle filled with beans and seeds dumped indiscriminately together, of all sizes, shapes and colors. If I hold this bottle quietly you will find kernels of all sizes in all parts of the bottle, but as soon as I begin to jar them, you will notice the big beans and big kernels all come to the top and the little ones go to the bottom. I want to offer this illustration and draw a parallel between these inanimate objects and these husbands of yours. When your husband was dumped out of college, he had perhaps an equal

chance and as poor a chance as any other fellow, but as the jar and vibration of life came upon him, he began to shift and to move up or down or stay on the same level according to his size professionally. The difference between your husband and the seed is, that the seed has its growth. It has taken its normal size and will not change either smaller or larger, but that husband of yours has the power within him to either shrivel or expand. If he shrinks, he will settle a little lower; if he grows a little bit, he is going to rise a little higher and get into bigger company. The curious feature about this is, the more jarring and vibration you get on that bottle of beans, the faster the small ones go to the bottom, so the harder the knocks your husband gets and the oftener he gets them the quicker he is going to find his level.

Dentists dislike the changing of their methods for fear they may offend some of their patients. If they have been doing an excessive credit business, they fear their patients will object if they attempt to make them pay cash. My opinion is that the patient who refuses to consent to adopt honest business methods, is very probably trying to get his service free.

As to insurance. I am sure that the dentist cannot carry his own risks, especially in these days of the X-ray, and the possibility of lawsuits, when he can secure protection by the expenditure of a few dollars a year. The Insurance Company will fight his lawsuits for him with good lawyers. Don't let some local lawyer's wife be wearing the new dress or hat that you ought to have. Your husband's trained hands are his only asset and a small policy is a legitimate safeguard.

The dentist's mental equipment should be kept polished and bright; by writing up his cases for the local meetings, by studying such text books as treat of the latest methods, and by regular and systematic efforts of study.

In about eighty per cent of the dental offices you will find the text books are bearing the date of the dentist's graduation, and if graduation took place twenty years ago, progress has probably died at that time. Knowledge that has gone into text book form should be in the hands of every dentist and be studied by him.

Modesty is a commendable virtue in a woman, but too many of my dental friends are altogether too modest in their ability to place something worth while before their brethren. Encourage your

husband to place his work on paper, help him correct his copy. Let him try it on you first. Your dentist's assets will be increased more by such efforts than any other, even if no one gains one solitary point except himself.

One great feature of the professional man's life is that he is his own boss. In the great army of the employed, from the shop girl to the man sitting in the President's chair, there is the ever present shadow of the boss. Employees will argue that they are not afraid of losing their jobs, but nevertheless they are. I have seen men turned out after a lifetime of service and devotion to a house, because the boss had died or had been changed and the present boss felt no longer any responsibility toward that employee. The dentist never has to go home to his wife and say "I am fired."

The dentist must ask only the same treatment from the public that comes to any other business and that is a fair return for loyal service. The masses do not know what a fair return is; it is up to the dentist to know that for himself first, before he is fit to teach the public. Have him quit guessing; make him quit, and I promise you new blessings that you do not now have and some of the good things of life you are letting others take from your husband because he will insist upon giving his labor for nothing.

Our standing in the community is frequently below level because our methods are so unbusinesslike. We are here together to talk things over, to help one another. If what I have been able to say here does not do that, I had better staid in the city and taken care of my own business. It is not in a spirit of criticism that I say what I do, but because I know what I am talking about, and if the women before me do not fall under the conditions I have named, you belong to the successful ones, and had better be out playing golf, unless you can find a way of helping the wife of some other dentist who needs such help. I have first hand information that makes me speak as I do, and I can sometimes pass along a suggestion that will really help. I feel optimistic regarding the future of dentistry, because I see so many men in the profession that are doing so well, when they apply sound business methods to their work and see to it that costs and fees are always in reasonable ratio to their work; with a knowledge of what they can give in service for the fees obtained; knowledge of the earning time, in which they are able to get returns to meet all emergencies; knowledge of what

amount can be taken out of the office so that the office will not be crippled; knowledge that will satisfy the income tax collector and still keep what belongs to the office at the same time. I have personal knowledge of enough men who are financially successful in dentistry, that I am bound to be an optimist. I am not placing myself as an example for your husband to follow under any condition. I am not telling you he does not know how to conduct his business, or that he is incompetent; I only say that there are thousands of men practicing dentistry that want help in this respect, and if it lies in my power to give them a push, I am going to try to push them up to something better than they now have. I want to plead for a more sensible coöperation among ourselves, as is found in every other calling these days, where men are working toward the same end, from the plumbers to the bankers.

Scientific knowledge is universal; business knowledge is universal; the income tax collectors will soon know more about the dentist's business, than he does himself. Men should be passing this knowledge first hand to each other and see if better business methods cannot be made the rule, rather than the exception; see if we cannot make him more enlightened, and stop his perpetual flirting with these "nerve" specialists with the gold brick artist; see if we can not make him a better and a more efficient operator; successful *both* professionally and financially.

You, my good wives, may become your husband's chief asset, if you can see the big things in dentistry. Spend what he can afford to have you expend and then let his office expend what belongs to it under fair rules of business compensation. You may be his worst liability if you are the whining, complaining, excessive spending kind—spending more than his office can give and still be safe. You ought to be proud to be his wife and more proud if he is a successful man, the kind that float to the top as did the large bean in the bottle. But if he is not successful financially, you can lift him up if you encourage sound business methods, and discourage that camouflage that he so frequently uses about his earning ability and the cost of transacting it.

God bless you; and may every husband within my hearing be willing to sacrifice every dollar he has and his life as well, before one American dentist's wife should ever fall into the hands of the fiendish, barbaric Huns, who are a menace to the world today. (Applause.)

PLASTIC ORAL SURGERY.* †

BY JOSEPH C. BECK, M. D., CHICAGO.

Mr. Chairman, Ladies and Gentlemen: After spending the last half hour in this church listening to the songs and speeches one should have a paper that is in keeping with the spirit, and I am very glad to say that I have it. My subject deals precisely with the proposition of plastic oral surgery, the reconstructive reclamation surgery of the face and neck, the question of the association, the proper association between the surgeon and the dentist. It is with that idea of association that Major Blair and I have been working on this subject. I have had the pleasure of assisting in the training of the men in this oral and plastic surgery department. The greater number of the men that I have instructed were of your profession, and it pleases me very much to say that the majority of them adapted themselves to the condition, strange to them as a rule in civil life, very rapidly.

It was found a great advantage in the reconstruction as well as the reclamation work or the subsequent correction of deformity, to have these two forces work together, and when they found that the dental profession and the oral men readily grasped the ideas that were promulgated by the Surgeon General's office it was comparatively easy to produce results on paper as well as in practice in this Department. And the Department of Oral and Plastic Surgery is prepared to do very good work.

I have here, Mr. Chairman, some illustrations made by two of the students, Lieutenants Hughes of the Chicago and Strausser of the St. Louis schools, who showed their adaptability to this work by making drawings, at the time the work was given on the cadaver, and in presenting these at the Surgeon General's office many comments and compliments were given and one was advanced in his commission. I am certainly very much gratified with these illustrations.

Now I take it for granted that I have been asked to come down

*Delivered before the Illinois State Dental Society, May, 1918.

†A fuller account of these operations, with very numerous illustrations, may be found in a book entitled "Plastic Surgery of Face, Head and Neck," by Joseph C. Beck, M. D. Published by C. V. Mosby Co., St. Louis.

here to show you matters that would be interesting in the first place, and secondly that would be of real benefit. I am particularly interested that you should give some attention to doing this work. I am afraid that the men throughout the country, medical as well as the dental profession, are not awake to the possibility of what might be asked of them, not in going to the front, but after the battle, after the injuries, when the men are coming back. The Department of Reclamation and Reconstruction in Washington is far advanced in that line and we must keep pace with their work in order to qualify. It is a splendid work, the plastic, reconstructive surgery which will come into play is splendid for the dentists as well as the medical men. Heretofore it has been controlled mostly by inefficient men—beauty parlors have done this work, poorly of course. There have been few who have taken any interest in it, but now comes the time when it is essential that you should become proficient in it. I will now show you a number of lantern slides of this work, not dealing with the subject in detail, not intending to teach you plastic oral surgery, but give you the scope of the work that has been covered. And if I have interested you enough that you get busy and go to work I shall have fulfilled my obligation to the members of your Society and I shall feel repaid for coming down here.

The following conditions were demonstrated on the screen:

Ten slides illustrating the history of plastic surgery.

Forty-seven illustrations of plastic operations on the cadaver. Reconstruction of the external nose and ear; the upper and lower jaw.

Two hundred fifty illustrations of plastic operations on the living, on external nose, ear, face, eye, frontal sinus, cleft palate, hare-lip, larynx, upper jaw, facial nerve and muscle.

HOW CAN AMERICAN DENTISTS HELP WIN THE WAR?*

BY DR. M. R. HARNED, ROCKFORD, ILL.

A great, sturdy, intellectual bully has arisen in the world and "run amuck." He is coming up the highway of civilization like mad, "shooting up" the population, destroying homes and villages, cities, and countries, devastating everything in his path; he brooks

*Read before the Illinois State Dental Society, May, 1918.

neither suggestion nor interference; his depredations are the most barbaric ever recorded in history. His excuse is "we are the supermen," "to us belongs the right to rule," "might makes right," especially the Divine right of kings.

The real reason is that his own people became impatient under the burden of his imperial taxation for military purposes. He is out now to show his people what an imperial government is good for. *Nee*, to go out and conquer peoples and levy tribute, thus getting funds to relieve his people. In order to make this appear right he began some years back to educate his people to the idea of their superiority and next the idea that the rest of the world was trying to starve them by economic means.

His tremendous preparation and disregard of life of his own people make it possible for him to whip any one, perhaps two or even three nations. He forbids our intercourse and trade with his enemies and murders our citizens who disobey. Shall we sit placidly and see this bully destroy one at a time our neighbors and levy tribute on them and come on to us with his world subjugation and tyrannical methods? We think not. He wanted to make peace without annexations and without indemnities, one of the nations en-route, with high philosophical ideals, decided not to fight him but to be "non-resistant." Now these peoples are fast being subjugated and enslaved. We thought he lied, now we know it in a thousand ways, and we know that no compact made with him will count—when he wishes to break it.

There is but one thing for us to do. Throw ourselves into the fight against this monster and let nothing remain undone which can be done to bring him to justice. And so we find ourselves starting into what may prove a long war and the most terrible war the world has ever known. Will we get the bully? Yes! When? Just as soon as possible.

We are fighting the world's fight of the people against kings. Let us throw every ounce of force, every idea of service, every dollar of cash, and if necessary our very lives into this fight of the people for self rule against the Pan-German idea. In order to do this we have got to raise men and equipment—we have got to raise food for ourselves and our neighbors—we have got to raise money, a lot of it, and we have to raise hell for the kaiser.

When the essayist was asked in January to write a paper and

given his choice of subjects, little had been done toward organizing the dental forces outside the army corps, for rendering free and helpful professional service to drafted men. Since then it has been so completed as to need few suggestions. Through The Preparedness League of American Dentists—under the auspices of the National Dental Association—that master organizer, Colonel W. H. G. Logan, with his able assistants, Lieutenant W. A. Heckard, and in Illinois, C. N. Johnson and George N. West, with two thousand co-operating dentists through the state, are rendering the equivalent of approximately two hundred dentists constant service to care for the defective teeth of drafted men before entering the army—we will soon have records to show what we are doing, but being a new proposition it takes time to work it out. We trust that the next draft will be handled efficiently. I want to urge every ethical dentist if he is not registered with the Exemption Board of his county, without delay to see his name is there for this service.

In our town of Rockford we have thirty-two dentists co-operating and giving the equivalent of more than four men's constant service.

When the drafted man reaches the cantonment he will find the dental corps finely equipped. At Camp Grant the service is under the direction of Lt. Colonel Scott, a quiet, courteous gentleman, whose sixteen years of dental service in the U. S. army, together with his professional ability and a vision of service, makes him an ideal man for the work; his assistants consist of from thirty-two to forty-six graduate dentists who seem to have grasped the idea of efficient serving and are not restrained by the patient's fear of being hurt nor his inability to pay.

Their equipment has been slow in arriving, but is strictly up to date, with electric engines, fountain cuspidors, modern sterilizers, fine laboratory equipment, N₂O apparatus and the finest radiograph equipment that can be procured—this service being free, enables them to know many things which we guess at. A trip to this wonderful base hospital or the field hospitals is most interesting.

It is supposed that every dentist and every citizen is contributing all he can toward the support of the National Red Cross, and the "Fosdick War Service Commission," which delegated the service inside the camps to the Young Men's Christian Association; The Knights of Columbus, The Salvation Army, etc.

These organizations are doing wonderful work, which disarms all prejudice as to narrowness, for if they were narrow they are not now; each in its way is giving what it has in service, with no thought of self, only the welfare and help for the boys away from home. They are all doing everything in their power to keep the boys pure and right and are performing a work which could scarcely be done by others, and deserve every dollar we can spare to them.

Outside the camps the commission operates under the name of "War Camp Community Service," and is organized to provide entertainment of high and suitable class in towns adjacent to cantonments. The danger to boys is in being lured while away from camp into various vices which may wreck their futures, and it requires great tact and judgment to minister wisely.

You know the two disease curses of this war have been syphilis and tuberculosis and every possible precaution should be taken to protect our boys from contamination with these dread diseases. The trench life is particularly conducive to tubercular development, over 500,000 cases have been reported on the side of the allies since the beginning of the war. The dangers of venereal diseases are great because the boy is human, he is away from home, he wants woman's society and there is added a little element of desperation from the fact that he may never come back.

These dangers make it necessary that we surround our boys from the time of their leaving home with such interests and associations as will make for clean and wholesome living, with pleasant surroundings as near home life as possible, entertainment, amusement; religious, educational and social activities, which shall drive away home-sickness, for this is for many the first stay away from home. The life should be so full of things worth while that there will be no time for anything morbid to creep in.

All this means a tremendous effort on the part of our citizens. Hundreds of millions of dollars have been and must be given, sacrifice of time and effort without limit must be made and with it all we must maintain a spirit of joyful helpfulness and confidence which will encourage and sustain the boys in the great struggle they are to make for human liberty.

Really we are glad to be able, and do what we can, and as one man put it, "We do not begrudge one cent of all these millions given, nor the sacrifice made if it saves one boy, if that boy happens to

be my boy." Let us as dentists then support these activities to the limit of our ability.

A word about Liberty Bonds and Thrift Stamps. The least a dentist who professes patriotism can do is to loan his savings to the Government at a reasonable rate of interest. He is making a good, safe investment as an individual and striking a vital blow at imperialism. If you haven't cash to buy them see your banker and you will find he will loan you enough on them as security to enable you to buy a lot more than you otherwise would and I suspect it will prove a splendid saving scheme for many dentists.

We can help to win this war by an enthusiastic and patriotic backing and sustaining of the administration which has the planning and doing of this tremendous "new job." I am happy to say this is the general attitude of our people as witnessed by our acceptance of "conscription," which at first seemed impossible, but now we recognize it to be the only fair way to raise an adequate army in the required time.

Criticisms may be good if they are made with the idea of bettering conditions. Investigation should help the one investigated if he is honest and it should help enlighten the investigators, but investigations should always take into consideration the conditions involved, and not be influenced by petty politics. It is a poor time to rock the boat when its loaded to the water's edge with all we hold dear just because the man at the helm or the oars belongs to another political party.

One of these political moves which is being injected at the present time is the attempt to have Congress enact laws which shall provide for universal compulsory military training.

Picture a small country town with no paid fire department, and imagine that town in the midst of a terrible conflagration which threatens to destroy every home and shop in the place, imperiling many lives; the whole community is alert and fighting the fire, exerting every effort to save lives and homes.

What would we think of a man or a set of men who interfered with the struggle to propose and vote upon a measure to have compulsory fire training for every boy between the ages of eighteen and twenty? We would immediately suspect he had some patent fire helmet or extinguisher out of which he expected to get revenue or glory. We ought to turn the hose on "Him" and send Him

and Chamberlain back to Crab Orchard, where they can plan another political revolt.

"The one great aim of this war is a just and lasting peace, every detail of war is wanton destruction unless it proves to be a war to end war." If the war is settled as the allies hope and expect, it will mean disarmament and such a measure would be folly, besides we have adequate legislation in War Departments General Orders No. 49 issued Sept. 20, 1916, Sec. 40 and 42, which empower the President to provide military training through the school years, thus giving the boy the discipline when he needs it most and does not take him out of productive life for this special purpose.

A nation which lives in times of peace under universal military compulsory service is a nation of slaves to exactly that extent, and to adopt such a measure at this time would place the U. S. in the class with Germany, Austria and Turkey.

Gentlemen, this is a time when we should rise above petty politics, and party fealty should give place to national patriotism.

Many of our boys are leaving home for the first time, there will be many distressing cases of home sickness, but one of the consolations of this sickness is that the patient usually gets fat. What he needs is not maudlin sympathy nor tearful treatment but good luck, good cheer and a realization that we are expecting great things of him, at least his best. He needs to feel that every worthwhile man and woman is with him to the extent of their ability.

In the cantonment towns we find need for other things, it is our privilege to minister to them in many little thoughtful ways which give the boy confidence in humanity, but I feel there is no one thing of more importance than fathering and mothering them. We try to make the boys who come to our home feel that it is their home and I am surprised how finely I am responding, for I feel a sense of paternity and proprietorship quite out of proportion to my service. I come to feel the boys are my boys, and while I think it does the boys some good, I know it does me much more. I dreaded to see the cantonment located with us and to see the boys come; now I dread to see each contingent go, for I feel they are our boys as never before.

Do you see that line a hundred miles long of iron helmets, steel guns, flashing bayonets, marching on toward Paris and the western front? A German wall of hate nearing America, and yet

Germany could mass three million more men to close up any gaps the Allies can make.

The mailed fist draws nearer to Paris, don't be deceived by big headlines in the papers as to the possibilities.

It is like a great black cloud shutting the sunlight out of western Europe and drenching France with blood—advancing, still advancing. Uncle Sam only by rushing millions of men and billions of foodstuff can stay the march of the German hordes.

We hold the key to the conquest for "food will win the war." Let us for God's sake and the sake of human liberty not prove faithless to the task. Let us pay our taxes with pleasure; let us buy bonds and war stamps; let us Hooverize; most of all, let us produce, and if need arise consecrate all to make good the words of our President.

Our answer to Germany shall appear in the utter sacrifice and self-forgetfulness with which we shall give all that we love, and all that we have, to redeem the world, and make it fit for free men like ourselves to live in. This now is the meaning of all that we do.

MAKING SAILOR DENTAL ASSISTANTS.

HOW THE SPECIAL TRAINING FOR NAVY HOSPITAL CORPSMEN AT
UNIVERSITY OF MINNESOTA HAS DISCLOSED POTENTIAL
ABILITIES.

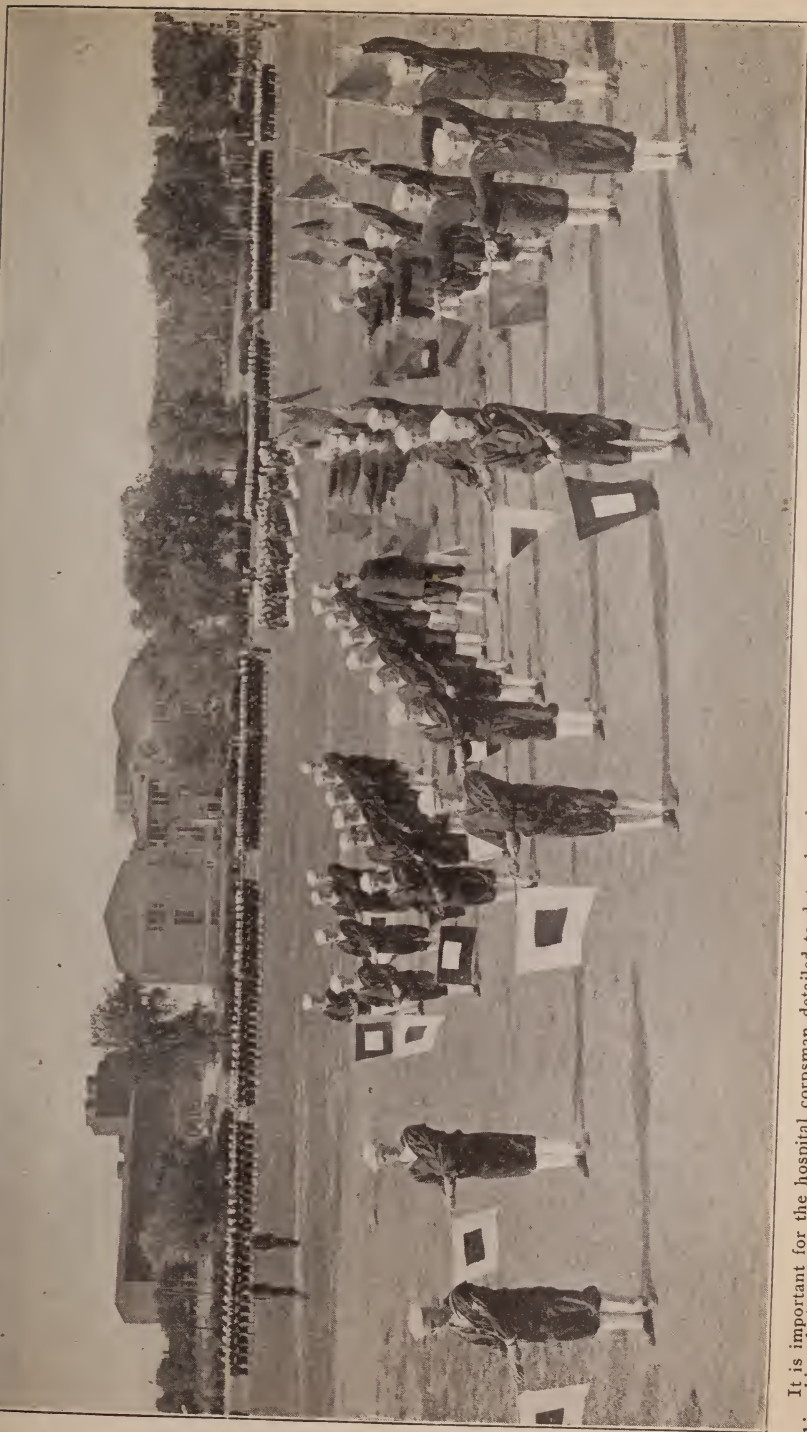
BY WILLARD CONNELLY, U. S. N. R. F.

No longer is the matter of training sailors in dental college an experiment. It is an established work of merit. The move is timely, and it is indubitably contributing its bit toward waging a stronger war. Navy hospital apprentices must be intelligently medical; to arrive at the clearest understanding of their uniform duties those bluejackets with a practical insight into the medical specialty of dentistry are the men who can approach the top rung of efficiency.

Hospital corpsmen are recruited from all walks in life—from chiropodists to embalmers, from drug clerks to ambulance drivers. Some as civilians were pointing to the study of medicine, some were dental mechanics. But when last winter the rudiments of dentistry were incorporated into the schedule of instruction for sailor



Every afternoon at the conclusion of laboratory and classroom work the navy students assemble on the parade ground, where the hospital apprentices are put through a rigorous stretcher drill.



It is important for the hospital corpsman detailed to duty aboard a small vessel to know how to signal for the medical officer, who may be stationed on a big ship of the fleet.

surgeons' assistants at University of Minnesota the noteworthy outgrowth of this addition was that fully a quarter of these enlisted men discovered in themselves a more pronounced talent for dental work than for anything else. This percentage is, of course, exclusive of those few who had had dental experience previously.

Men who show natural aptitude for dentistry are given opportunity to assist the dental surgeon aboard ship. Besides, when this surgeon is not present they can work independently, in emergency,



These plaster casts of their own jaws which the men so industriously make in the prosthetic laboratory they keep not as souvenirs but as valuable objects of reference for future study.

within a prescribed field. They can extract, make a temporary filling, wire a fractured jaw. When their cruise is over these dental apprentices can go ashore and study for their profession. Nothing bares ability like war.

In the condensed course of four months' training which these corpsmen undergo, embodying practical nursing, anatomy, pharmacy, bacteriology, and minor surgery aside from the dental instruction, the typical feature of the latter may be found in the very comprehensive work offered in operative dentistry. This study is presented in lectures with lantern slides, in operative observation

demonstrated clinically to the navy students in sections of ten, and in the examining room where the apprentices under assistant instructors first work with extracted teeth then upon civilian patients.

Tooth operations both for relief from pain and for arrest of disease are considered. Taking up tooth tissues and supporting structures the men learn the constituency of enamel, dentin and pulp,



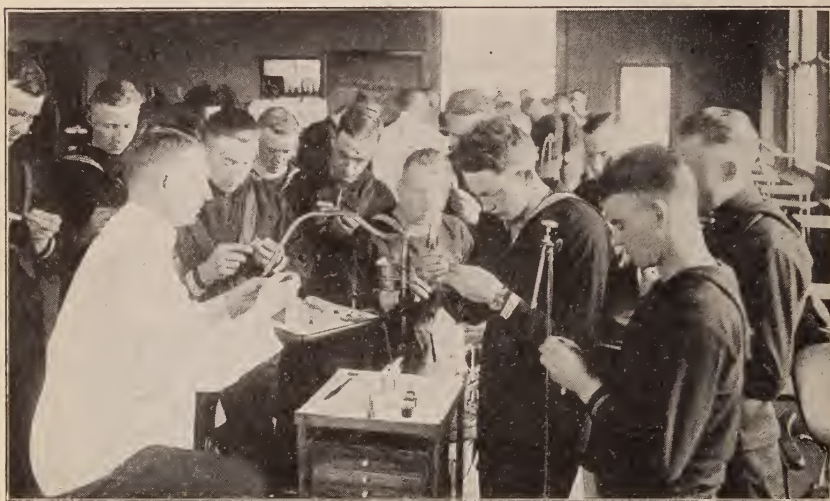
Lectures in dental anatomy are extremely graphic. If an apprentice doesn't get what the instructor is talking about he at least can see it on a chart, or in one of the huge model teeth which are passed around the class.

with the relation of the last two to blood vessels and nerves, and the nutritive function of the pulp. In diagnosis, irritation of the pulp is pictured, with its consequent development of more dentin. This leads to a general explanation of caries and dental abscess. Inside of a week every corpsman in the class is sure he is afflicted with both to an alarming extent, but in only a few cases, ultimately remedied, has their concern proven justified. So this dental work takes hold through its direct personal appeal, to the end that the pupils quickly become converts to mouth cleanliness as never before.

Exposure of dentin, of cementum, traumatic and pulp inflamma-

tion are studied and made clear through reference to sensitiveness in decayed or poorly filled teeth. One of the corpsmen whose radiograph showed abscesses at the roots of two front teeth was relieved by the familiar operation of having the root-ends clipped off and filled, after an incision through the gum. Oral surgery demonstrations of this sort, at which the bluejackets assist, afford invaluable therapeutic training.

Incident to their probable future task at sea of making temporary stopping when a mate reports in the sick bay with toothache, each bluejacket is next taught the use of the curved exploring point



In operative dentistry, after preparing cavities in extracted teeth, the navy men proceed to work up amalgam or cement fillings and insert them.

and mouth mirror. They practice upon one another, examining all proximal, buccal and lingual surfaces. Assuming failure to find cavities, each man is shown how to apply the hot and cold test for pulp inflammation. Where the peridental membrane is inflamed the sailors are taught to look for food deposits, lime deposits, or for a pulpless tooth. After the first month such exploratory work is largely held in the civilian clinics.

The ensuing stage of this operative dentistry course, treatment and prognosis, evokes particular interest amongst the apprentices, who in intimate groups gather about the instructors and, using various extracted teeth to start, follow each precept as laid down.

With engine or chisel all decay and softened dentin is removed, while it is advised that for temporary requirements as the sailors are likely to attend upon, it is better to avoid cutting too deep, lest the pulp be endangered. So by medication and temporary fillings to tide over the patient until the ship puts into port, the men become familiar with emergency work of high value. Use of chisel, hatchet and hoe excavators, in the matter of gaining access, is taught, while the corpsmen are shown how to make the cavity a little larger inside than at the orifice, in order to retain the filling. The instructors bear in mind that some of the navy men are likely to be detailed to ships where no dental engine is available, so that sort of "tooth repair" is shown which can be carried on without the aid of an engine. Warm water syringe, cotton rolls and napkin are used in fundamental demonstration. For temporary stopping, each bluejacket is familiarized with the cotton pellet dipped in eugenol, oil of cloves, phenol or creosote.

Finally the sailors are given a series of lessons in filling materials, for emergency procedure. Amalgam, cement and gutta percha are taken up, in addition to the cotton just mentioned. Each man rubs up the silver and tin base, adds mercury, and expresses excess of the latter after about three minutes' trituration, then packs shallow cavities only, with flat-end instruments. The liquid and powder cement fillings the men mix on glass slabs, to the consistency of heavy molasses.

"Put this cement into your cavity as a glazier putties a window-pane," says the instructor, and every man then knows how to go about it.

"Hold your cutting instrument as you would hold a pen," he says again, and the sailors quickly acquire the knack.

Positions best adapted for patient and operator are explained in a short talk, with the injunction that it is never well to stand at the left side unless the left lower jaw is to be worked upon. All these elementary points are, of course, tedious reading to the dentist, but I review them to show about how far the hospital apprentices can progress in the hurried wartime stretch of four months. Reports from sea already at hand show that this training has been timely and well inculcated.

A course of stirring lectures by Dr. Hartzell, research specialist, has awakened in the men a very keen response, so that they are

individually committed to the duty of examining the teeth of their mates who show up at sick call and present a more or less obscure affliction. To insure healthy gums and mouth the lecturer has admonished the corpsmen to brush their teeth eight minutes, never less than five, with all the strength of the good right arm.

"In a healthy mouth," he tells them, "we find three to five million 'strep,' 'staphs' and pneumococci, but in an unhealthy mouth six hundred to eight hundred million! (here several of the students fall off their seats). What happens if one of your marines with an unhealthy mouth has his jaw shot away? He dies. If he has



After a talk in oral hygiene the hospital corpsmen take chairs and remove calculus and stains from the teeth of one another.

a clean mouth, he recovers. I want you all to preach the gospel of the toothbrush to every man you attend aboard ship or in France, for you can thus save fighters and help win battles. Suppose you are aboard a destroyer in rough weather, decks awash, and some of the men on heavy duty get tired. What happens then? More bacteria begin their drive, in an unhealthy mouth. The man gets a chill, the pneumococci get busy, and the man stumbles into the sick bay. A well-scrubbed mouth would have heightened his resistance. Tell him that, but tell him before the rough weather sets in!"

The work in the prosthetic laboratory is designed to give the apprentices a comprehensive idea of dental anatomy, and they take to their exercises with as much zest as if they were helping Santa

Claus make toys for the kids. They begin by taking full upper and lower impressions with the rubber modelling compound. From these they make plaster casts, which they mount upon a wire articulator—so every student has a “life mask” of his teeth and jaws. The value of the personal appeal in such an experiment cannot be estimated too highly. Not a tooth but whose peculiarities and functions become quickly recognized. The next job is to model an upper jaw and mandible in clay, and from a trayful of miscellaneous extracted teeth to select the set of thirty-two and imbed them properly, obtaining normal occlusion. Then the corpsmen cut cross and longitudinal sections of molars and incisors, to study the formation of enamel, dentin and root canals. These laboratory periods are naturally supplemented by anatomy lectures, where the whole class is instructed by charts, gigantic model teeth and blackboard talks, in the arrangement, development and importance of each tooth.

One of the most interesting courses is the oral hygiene, built largely around the abortive treatment of incipient gum disease. The instructor takes the bluejackets in sections of ten, for a lecture, after which the men proceed to the examining room. Here the instructor goes over the mouth of each man, pointing out pathological conditions and recommending the necessary treatment. In the lecture the sailors have heard the causes of gingivitis, calculus and stains, they have seen charts, casts and photographs showing bacterial, malocclusive and systemic causes and symptoms, they have handled the instruments for removing calculus and stains. So, after viewing aforesaid pathological conditions of each of their mates they begin at once to work upon one another. True, this method gives rise to an occasional “damn” when the scaler slips, but revenge follows after a few minutes’ tinkering, and at any rate they are all eager to have their teeth made ship-shape. When the navy students have developed facility in these operations they are allowed to work upon civilian patients, so that by the end of four months’ practice they have a pretty good idea of what a “well-kept” mouth should be.

Other points here taken up are the pathology of acute and chronic apical abscesses, results of impacted teeth, and of abnormal occlusion due to loss of the first molar, the relationship between oral infection and systemic disease, emphasizing the rheumatic chain of diseases. Frequent opportunity is afforded for the observation

and treatment of pyorrheal cases, and of diseases of the gums which may be mistaken for pyorrhea. In connection with the discussion of systemic disease which may follow unhealthy mouth conditions the corpsmen are shown that too often the seat of pain is treated for the source, and they are warned to look to the teeth in certain cases of arthritis, kidney, heart and stomach trouble.

The navy enthusiasm which attaches to practice in the extraction clinic is excelled in no other department. These apprentices



Sectional instruction for such small groups of men in the extraction clinic affords a chance for individual attention and the bluejackets profit accordingly. The man on the left is injecting novocaine into the gum.

know very well that when their ship is a thousand miles at sea and a sailor has a bad toothache that sailor is apt to demand extraction and brook no temporary filling business, inadvisable though extraction may appear. But, of course, there are many cases where extraction is the only remedy, and upon such conditions—broken arches, broken teeth, broken-down roots, acute abscesses and decay half or more—the corpsmen concentrate. Since about a thousand extractions weekly are performed at the university clinic it can be judged that the men see experience in good variety with the universal forceps. They also learn how to inject novocaine and to

control hemorrhage with adrenalin chlorid packs and tannic acid. This training is supplemented by some work with fractured and dislocated jaws, at which operations the bluejackets assist.

When it is considered that the foregoing introduction to dental rudiments constitutes only one of ten courses of instruction undergone by these men (the other work being carried on by the medical college and at drill by naval officers) it can be seen that such hospital apprentices are on the road to become very satisfactory pharmacist's mates, to which rating they are promoted when they depart for sea duty. Commander Warren J. Terhune, U. S. N., commandant of all U. S. Naval Training Schools in Minneapolis, feels that his corpsmen will acquit themselves with distinction.

ILLINOIS STATE DENTAL SOCIETY PROCEEDINGS

DISCUSSION OF DR. BECK'S PAPER ON "PLASTIC ORAL SURGERY."

DR. A. D. BLACK (Chicago):

I want to say a word in regard to the type of dental men who are entering this work. In the groups of officers sent to our school for the four weeks' course of instruction to which Dr. Beck and other men have contributed as instructors, we have had an equal number of physicians and dentists, general surgeons and dental surgeons. The course in anatomy was given to these groups in our medical school. The names came to us from the Surgeon General's office with the general surgeons in one list and the dentists in another list. Before sending the list to the medical school for the course in anatomy, I had all the names arranged in one alphabetical list so that the professor of anatomy did not know which were dental surgeons and which were general surgeons. They were all quizzed daily throughout the course and all took a written examination at the close. When the report came in, we were pleased to find that in both the recitations and the written examination, the dental group averaged just a little bit above the general surgeons.

While I have for a good many years known something of the work Dr. Beck and his brother have done in plastic surgery, I have during the past year had a better opportunity to come in closer contact with this work, through the fact that Dr. Gilmer and myself have, in our official capacity in the Northwestern

University Dental School, had charge of several of the officers' courses in plastic and oral surgery for the Surgeon General of the Army. I cannot say too much in compliment of the splendid work which Dr. Beck has done in teaching these important reconstruction problems to the medical officers of our Army. Dr. Beck has done this work not only in Chicago, but also for similar cases in St. Louis, and he has given unsparingly of his time to do it, so that the dental profession is under particular obligation to him, not only for the work that he has done in teaching these officers, but for giving to us at this time this splendid presentation.

It is rather strange that the work of this Italian doctor, Taglicozzo, published in 1540, should have appeared at almost exactly the same date as the first record we have of a dental book—in 1534. It is more of a coincidence, I think, in view of the fact that this work of plastic and oral surgery in the Army is one of the developments of war work which is bringing the medical and dental professions closer together. Plastic and oral surgery in the Army and the problem of focal infection are the two things that are serving now to cement together the medical and dental professions.

It may be interesting to say just a word regarding the work of the Plastic and Oral Surgery Division. The plans of the Surgeon General's office contemplate 160 base hospitals in France and this country. Each of these will have what is known as a head unit, which is composed of five specialists; a brain surgeon, an eye surgeon, a nose and throat surgeon, a plastic surgeon and a dental-oral surgeon, as he is officially called. In each unit, the plastic surgeon and the dental-oral surgeon are paired, and work together. Major Blair, of St. Louis, whom many of you know, is in charge of the Division of Plastic and Oral Surgery. May I suggest that those who contemplate entering the Army service and wish to familiarize themselves with this work should by all means secure and study Dr. Blair's book, because it is most valuable and opportune. I hope before long we will also have a book by Dr. Beck and his brother covering the field of plastic surgery of the head and neck; a book that is very much needed.

Dr. Beck has shown us some of the possibilities of plastic

surgery of the face; he has also impressed the necessity for this work. We have seen tonight a number of pictures which serve to exemplify what might be called one of the miracles of this war. After the war is over, the progress in plastic and oral surgery will stand as one of its remarkable developments. I am inclined to believe that this division of plastic and oral surgery will come to be one of the permanent divisions of surgical work, and it is a wonderful opportunity for the better recognition of dental service.

We have seen pictures which will give us some idea of the work of reconstruction which must be done upon many of the men. I have seen some of this work myself in the Canadian hospitals, some of the cases before the reconstructive operations, some which were operated in England and others operated after the men returned to Canada. Dr. Beck has mentioned the two conditions under which these operations are performed—the immediate operation, as early as possible after the injury, and the operation of reconstruction after the healing of the original wound. Our Medical Department in Europe plans to do the immediate operation upon the largest possible percentage of cases. But a short time ago most of these cases of injury in battle were treated temporarily because they did not get back to the Base Hospital for real operation until they were infected, and for that reason no work of reconstruction could be done. This plastic work cannot be done until the case is free from infection. Therefore these cases were taken care of primarily to get rid of the infection, and by the time that was done many were horribly disfigured on account of the fact that proper prosthetic appliances had not been used. In many cases the work of reconstruction has been delayed for months and in a few for a year or more.

In order to understand the real difficulty in the management of these cases we must have in mind the fact that space back of the fighting line is very valuable and it is divided for various types of service. For example, the Commissary Department is allowed so much space for each mile of the fighting line, the minimum amount they can possibly get along with in order to bring forward the food and other things which that department supplies. A certain amount is allowed for the Ordnance Department, a certain amount for the engineers, a certain amount for reserves, a certain amount for medical service, etc. No depart-

ment has as much space as it really needs and each is allotted the minimum amount it can get along with. The medical department has always been fighting for more space closer to the front so that injured men can be cared for with less delay. The principal object is to get cases before they are infected, so that the entire operation—including whatever is necessary in reconstruction—can be performed at once. The Plastic and Oral Surgery Division of our Army expects to have this service rendered so close up to the front line that they will get their cases within five or six hours after injury, which means that infection will not have taken place, or at least will not have progressed, and there is every expectation that a large percentage of these cases will be operated immediately, and thus avoid much infection and deformity. The tendency in war surgery is to get the cases early, clean up the wounds, cutting out all injured tissue, and close the wounds immediately. Enough of that work has been done now to know it will be highly successful in a large percentage of cases.

I was reminded by the picture showing the artificial nose attached to eye glasses of a case that I remember under my father's care when I was a boy. A man had his nose shot off and was sent to my father for treatment and he made him an artificial nose of vulcanite attached to a pair of glasses. He was not very well satisfied with the shape or color of the nose so he made another one, which was satisfactory. When he was ready to dismiss the patient the man said, "Doctor, what are you going to do with that other nose?" My father said that he did not know; it was of no use to him. The patient, who was a carpenter by trade, replied, "Let me have it also; I will wear that on week days and save this other one for Sunday."

The principles of plastic surgery require in the first place a most perfect knowledge of the anatomy of all parts with which we are to deal, of the nerves and the blood supply especially, so that when tissue is moved the blood and nerve supply may be maintained. Flaps must be taken along the line of distribution of an artery so that the artery will feed into the flap and maintain its vitality.

We of the dental profession ought to be tremendously interested in this work; not that many of us will do much of it,

but all should know of it. We ought to know all there is to be known of it, whether we are going to do it or not. Many men in the dental service will have opportunity to do some of these things, notwithstanding the fact that the rules and regulations of the Surgeon General's office stipulate that dentists will not work on soft tissues. Dentists who are qualified will doubtless have the opportunity, under the pressure following heavy fighting, to do many things which are not mentioned in the regulations. I am sure this presentation should lead many of us to study this subject more and acquaint ourselves with it to the limit that we can.

DR. H. A. POTTS (Chicago):

Mr. President, Members of the State Society: It is my good fortune to be associated with Dr. Beck in some hospital work, and I can assure you that it is better than it looks on the screen. If you could see some of his stereoscopic pictures and see what he has done on the patient rather than the flat photograph I think you would appreciate the work all the more.

We are in the midst of war. We hear a good deal about all of us being in it, but the rank and file of the people at home have not realized this yet.

We must all get into it, and one of the first things is to prepare the troops. It should be done in camp before they go into active service, while they are having their training. Their mouths should be put into perfect condition. Infection is not a normal condition, but I regret very much to say that most mouths that we see—many of them coming across the street from a dentist—are still suffering severely from gingivitis. There are infectious bacteria in the mouth all the time. It is a shame that they are, but they are. I think some of the reconstruction work in the mouth had better be forgotten awhile and we get busy with a good pair of scalers or knives and trim margins of these overhanging fillings. It does not take very many good teeth to pass a man into the army; he is required to have three molars, above and below, and three incisors, above and below. If infection means anything at all, it means that it ought not to be right on the ground when a man has half his jaw blown away. Consequently, do not turn a man loose with any infection, whether it be the gums, mucous membrane or at the apices

of the roots. Some of these things do get well of themselves, but some do not, so why send a man across with that handicap. Get busy and clean up these mouths; free them from infection.

We hear a great deal about trench mouth, and we have every reason to believe now that it is what we know as Gilmer's disease, acute ulcerous gingivitis. You all know the treatment for that disease, that ordinary antiseptics is not sufficient, but it is easily cured by common sense. Clean up by forced washing with a solid forceful stream of water, which will wash this mass of bacteria away, and then fight it with its own natural enemy, which is oxygen, by the application of peroxid in combination with calomel *per orum*. Such treatment will clear up these cases in three or four days, while a treatment with a strong antiseptic in a dilatory manner by mouth washes does no good.

If we are all going to get into this, it must be team work, and the organization of these teams by the Surgeon General's office. The first part of that team must get busy right away.

As Dr. Black mentioned, the advantage in the use of the Dakin-Carrell method and solution has been that the cases have been gotten hold of very early. That will be the secret of the most successful reconstruction work. If these plastic operations can be done within twelve hours, before infection has developed in the parts, there will be less deformity in future years. There will be less scar tissue; but if the tissues are not brought together, that space will be filled with granulation tissue, which later is scar tissue, and to those who do not know, scar tissue about the face and jaws is very difficult to handle. Some of you have seen ankylosis, where the jaws have been held almost together simply by a little band of scar tissue, and you thought simply snapping that tissue and opening the patient's mouth was all that was necessary; but his mouth closed up just as before. We must avoid this scar tissue, and it can be largely done by team work, with the dentists right on the job at the time, twelve hours after injury or before, in making appliances to avoid this contraction of tissue, and also the formation of unnecessary granulation tissue, which later is scar tissue.

It seems to me that some of these raw surfaces might be covered by skin grafts. Later the Tiersch graft can be cut away

and reconstruction carried on, under more favorable circumstances. To those of us who do not expect to do that work I think it just as important that we familiarize ourselves with it in order that we can work with the surgeon and have some general idea of the thing to be accomplished. Consequently, we should all study repair of wounds—mix in a little bacteriology together with anatomy and learn something about the principles underlying this whole reconstruction business. Then, too, I would add in line with Dr. Beck's remarks, that the majority of plastic surgeons belong to the beauty parlor type; but as Dr. Black said, we must be able to treat a lot of these men who return, and if we are not able to do this work, we want to direct them where they can have it done and direct them where they must not have it done. In other words, keep them out of unscrupulous hands.

DR. A. D. BLACK:

I would like to add, in connection with this service flag, that Dr. Potts has received a commission as major in the army and is going to France to do this very work. (Applause.)

DR. T. L. GILMER (Chicago):

The hour is rather late and there is little left for me to say. Dr. Black's and Major Potts' discussion of Dr. Beck's paper covered the ground pretty fully.

Dr. Beck is a wonderful teacher. I have known his work for a good many years, and have followed him pretty closely, more closely than he knows, perhaps. Some of my work has been along similar lines.

The majority of the injuries in this war are of the chest, head, and neck. This is due to the fact that most of the fighting has been done, so far, from trenches, therefore the upper part of the body is the most exposed. On this account much reconstruction work will have to be done on the face, head, and neck to make the men presentable after they have been injured.

The thing that it seems to me should be emphasized even more than it has been, is this, the indication for use of some sort of mechanical appliances that will hold the parts in their normal relation while granulation and cicatrization is taking place. Take, for instance, the mandible. Suppose a part of the anterior portion is shot away. Those of us who have had experience in oral

surgery know what an awful condition is occasionally seen in cases following injuries of this nature. If nothing is done to support the bone fragments while scar tissue is forming, the anterior portions of the fragments of bone will be drawn toward each other, leaving a bad deformity. This can be prevented, providing a few teeth are left in the fragments. These will serve to carry a splint, which will hold the parts in their normal relations. By temporarily holding the parts in place, conditions are rendered more favorable for bone grafts. The splint that Dr. Beck spoke of, which is recommended by Dr. Blair, is for immediate or temporary use. Two pieces of aluminum are formed somewhat in the shape of impression trays, and united posteriorly. These are sufficiently plastic so that the upper and lower parts may be closed together or opened, as the case may demand. Its use is to temporarily support the injured mandible. Modeling composition is placed in these trays and the mouth is closed on it and a bandage is put about the jaws and head, which supports the parts until the patient can have a better appliance made. Major Blair hopes for good results from this splint.

Speaking about artificial noses, reminds me of an experience I had many years ago in an attempt to restore a lost nose. I used rubber for its construction and secured it by spectacles as Dr. Black said his father had done. I got a very good shaped nose and after it was finished I employed an artist to paint it for me. One cold day I met the man on the street, and it looked as though he had an alcoholic nose. The skin of the face was blanched, but the nose remained red. This is one of the difficulties with artificial noses, that is, they do not change color as the face does with the weather conditions. At the present, porcelain is used instead of rubber. They are more natural in appearance.

DR. L. L. DAVIS (Chicago):

Before closing this discussion I cannot refrain from expressing to Dr. Beck my appreciation of his efforts and presentation of a paper like this before this body. He is a very busy man and he has sacrificed considerable time to bring this matter before you, and I feel that it well warrants a vote from this organization to Dr. Beck for his efforts. I therefore move, Mr. President,

that this Society extend to Dr. Beck its appreciation by a vote of thanks for his efforts in this line.

(Motion seconded and carried by a rising vote.)

DR. JOSEPH C. BECK (Chicago, closing):

If you will permit me a few moments, I would like to thank the gentlemen who have so ably helped me out in their discussion by filling out matter which I did not have time enough to speak about.

Dr. Black has touched very vital points, especially when he spoke about the principles. When we try to teach the men this work we spend a great deal of time on the principles of the plasticity of the tissues, the plastic principles as they apply to the work we are engaged in at the present time. It is necessary that these finer points be drilled into the men.

Take the suturing of tissues, or the tension in handling tissues. The general surgeon, who is used to handling a mass of tissue, cannot handle a plastic flap as delicately as one doing special work. He frequently sutures as though it were the abdominal wall, and of course, that destroys the union. Anything that a horse hair will not hold in the form of a flap is because there is too much tension. That flap should be put so loose that only a horse hair or fine silk is necessary to hold it in place. In fact, if it were just put down and permitted to lie right there, it would be better.

Another thing is this, that in plastic surgery, no matter how many failures, if ultimately there is a result, we figure the victory one hundred per cent, because there is nothing that is lost except the inconvenience, except in one method in which the tissues are borrowed from the face, known as the German (I am glad to say) method. Then you must expect scars. But such a thing as the borrowing of the arm, the Tagliacotian method, or the use of the finger—the sacrificing of a finger for a nose is always easy. As a rule we find no objection, but recently I had a man, a movie actor, who had lost his nose by syphilis, because he did not believe in medicine, he was a Christian Scientist. When I said that I would use a finger for the correction of his nose, he said he was an artist and he needed that finger, but he was willing to give up a toe, so he is

ready now for the operation of double transfer as illustrated in the lantern slides.

The Carrell-Dakin solution is a most excellent thing. The best time for reconstruction is immediately, of course, as soon as you possibly can get the patient, but of course in handling large numbers of patients sometimes forty-eight hours passes before operation. But if we can avoid the use of the Dakin solution, if we can get the patient immediately and cut out to the margin of the infected tissues, if it has not progressed very far; that is the best time to get satisfactory results. But the Dakin solution is an excellent thing, and I am sorry it has been brought into so much discussion and disrepute as it has. It is getting back on its feet, however, and it will find a good place yet. I feel very kindly to the great little man, Prof. Carrell, because I have learned a great deal from him. I was fortunate in having good teachers—Senn, Carl Beck and Carrell—in plastic principles, and I think that may account for my enthusiasm and probably my getting better results. The principles Dr. Carrell has laid stress on in the use of the Dakin solution not only in early cases but in the later cases are very important. The modified Dakin solution is still better, according to some workers.

Who will do the operating, the dentist or the doctor? I would lay more stress on teaching the dental men this work than the physicians, because you know and I know from men who have been there and told me, that when the work is there you are not asked whether you are a dental surgeon or a general surgeon; the man is there and the work is to be done, and if the dental man is a good plastic surgeon, he will get a chance to do the work. But he should be prepared, and not only know it but know how to do it. I am getting very encouraging letters from over there, saying that the boys are doing good work.

I thank you for your compliments—how nice these things are. I wish to plead guilty that none of these people that I have operated on by plastic are nice looking, but they are grateful. There is a class that are never satisfied, but the man who has an external deformity, if you are able to make the least improvement, he is happy and usually satisfied.

A good point was brought out by Dr. Potts, as to the use of the Tiersch graft preliminary to later work. I wish to thank

him also for his reference to preliminary cleaning up the mouth so that there will be less infection. Of course, this is a big subject, but I wanted just to show you how big it is.

I thank you.

DISCUSSION OF DR. HARNED'S PAPER: "HOW CAN AMERICAN
DENTISTS HELP WIN THE WAR?"

DR. A. H. MUELLER (Chicago):

Mr. President: It seems to me this paper is a little too late—about twelve hours; it should have been given last evening at the patriotic meeting. Still I am pleased to be called upon to discuss this paper—it is full of patriotism and it is timely. A year ago the slogan was, "Be prepared;" today it is "Do your bit and do it well."

There is one thing in Dr. Harned's paper that roughs my fur the wrong way, and that is his stand on compulsory universal military training. I say the sooner we get into that, the better it will be for everybody concerned. (Applause.) I speak from experience, because I had the privilege of attending a school in this country where the United States makes it compulsory for everyone to take military drill. There is nothing that puts more pep into a young fellow, that gives him more poise; he is a man when he is through with it, if not before. If there is anyone who lacks patriotism, or if it has been shattered a little by German propaganda, he will soon get it back when he gets out in the color parade, when he stands at salute and the band strikes up "The Star-Spangled Banner." Another thing, it teaches a man to shut up at the proper time, and to take orders.

I do not wish to promulgate the German military idea; we do not have to look to them for that. Look at Switzerland and Holland! The wonderful machine they have is not militarism—it is patriotism.

There are not enough men doing their part on the exemption

There are not enough men doing their part on the exemption boards and the medical advisory boards. Quite a few boys and men are working on these boards and doing the work well, but some of the boards have not enough help, and you should get in touch with these boards and do your bit. I have heard men say they did not wish to be members of the Preparedness League of American

Dentists, because they did not want to put in condition the mouths of the men who are spending their money on liquor, and who are imposing upon the government their neglect of dental hygiene. There is a cure for this criticism. Take these men to the meetings of the Medical Advisory Board. There they will see that scrap-heap of America's unfit, a colossal mistake in hygiene resulting in every conceivable disease and deformity of man. It is enough to make anybody sick to know that these boys—many of whom are accepted—go to camp with their mouths in such condition. What chance has a man to study military tactics when he has a howling toothache, or to rest at night when he has a dying pulp in any tooth? Would any dentist like to be in his place? Then we turn to Germany. I do not know how true this is, but I understand they had compulsory dental examination of their soldiers fifteen years before this war. Germany, whose dentistry is fifty years behind the times, and yet they beat us to it.

Mr. President, this may be a different kind of talk, or a different kind of discussion than this society is used to, and it may be more aggressive, but I cannot conceive of any man, woman or child who does not get mad or become aggressive when he thinks of this war. It is beyond me.

Everywhere we see slogans that ships will win this war; we hear that men will win this war, and that food will win it. We know that ships alone will not win it, and that men alone will not win it; but we do know that we will win this war when every man, woman and child does his bit. The dentist can do his bit with the general public, and he can also do the stunts that he is fitted for.

While I back up the essayist in his statements in regard to buying Liberty Bonds, Thrift Stamps, helping with the various funds that are being raised, and so forth, there is a further stunt that the dentist can do, and I wish to point out to this assembly that the dentist has an opportunity of entering into this war in a more vital way than has been stated. Every dentist, if he is the right kind, is an artist in his line; he also has a spark of genius, because of his profession; he also has inventive ability and this means he has great power of imagination combined with the practical application. Modern psychologists say that a mind so constructed can reach great heights of inspiration. We know what great leaps dentistry has made through the ability of men like Black, Brophy, Callahan,

Logan, and many others. Therefore, I take it that the greatest duty of the dental profession in helping to win this war is to develop the mind in the inventive channels, so that scientific progress will be made in the next two years that without this stress of war would take twenty years. Great minds, when under the stress of epoch-making history, unconsciously do in a few months what ordinarily takes years. Therefore, I wish to impress upon this assembly that every man who has inventive ability, imagination combined with mechanical skill, should feel it his duty to give to the world—except Germany—the results of his inspiration which is commonly called a discovery. Many men will be discouraged when they attempt this because they will work along day after day without any apparent results. But suddenly the inspiration comes. It is not luck; it is the development of the spark of genius. Undoubtedly there are many men in this audience who could follow the line of this suggestion. When Vogt was selected by Lee S. Smith & Sons to perfect a filling material, he had a definite goal toward which he was to advance. He did not get there in one year or in two, but he knew from experience that he would get there, because he had a trained mind. When Dr. Logan started out a year ago to organize the Reserve Corps, he admitted that he had hard work ahead of him, soon he got a few volunteers, and then more, and before long he had twice as many as he needed. Then he was made major, then lieutenant colonel, and today he is Colonel Logan, and I am mighty glad to know it. That was the result of hard work.

The mind under pressure acts at a much greater rate of speed than under ordinary conditions. Now the thing that every man here must do to accelerate his mind is to get into actual contact with war activities and obstacles. I know that no man can serve as a dental examiner on a medical advisory board in the very best locality without seeing the deplorable conditions due to lack of dental hygiene. Aside from the help that the individual examiner is giving to his country by devoting two or three evenings a week to this work, if he is a dentist of the first water, his imagination will be stirred, his realization of conditions will arouse in him the depths of his nature and must lead him to use his influence to procure scientific help and protection to our soldiers not dreamed of today. One of our war poets has put this idea of mine into verse, and it runs like this:

"So, at this hour, when the Old World lies sick,
Beyond the pain, the agony of breath
Ha'rd drawn, beyond the menaces of death
O'er graves and years leans out the eager spirit.

First must the ancient die, then shall be quick
New fires within us. Brother, we shall make
Incredible discoveries and inherit
The fruits of hope, and love shall be awake."

In conclusion I will say that the dentists will come across with their stunts to win this war just as they have come across in the Reserve Corps. We are showing the public what we are made of, and we will continue to do so to the last dollar and the last man, if necessary.

WHAT DENTISTS CAN DO TO HELP WIN THE WAR.

DR. FRED W. GETTIRO:

I desire to compliment the essayist very highly for his excellent paper and I especially desire to compliment him in the selection of his subject. Anything dealing with the winning of the war is not only timely—it is imperative. The people of this country need to be continually educated, aroused, yes enthused on this all important crisis in the world's history. The more one knows of the actual conditions in this country, the more such an individual realizes the great necessity of arousing enthusiasm. If you doubt the truth of this assertion then I ask you to listen to a brief statement of the financial condition of this glorious government of ours, and then think of the conditions we have observed during the last few weeks. The United States Government is worth 250 billions (I wrote billions because I cannot conceive in figures just how much that would be) with less than ten billions of debt and more than forty billions of income every year. Here is the question. Why should this government have to flood this country with every form of advertising, use all known and unknown methods and agencies to interest, persuade and even threaten our slackers to compel them to loan a little of their money to our government at a good rate of interest plus the best security the world has ever known? In Chicago during the last Liberty Loan drive one could have heard on most of the busy corners every well known musical instrument, every sort of vocal at-

traction, every available movie star, every speaker that had any voice left and yet not until the last day of a four weeks' drive did we arrive at our minimum quota.

The time for any sort of argument or reasoning on the causes of this war has long since passed. The line of demarkation is now very definite. An individual is for or against the United States. No one can say or even hint that he is not interested in the war. If he is not heart and soul with the United States in this crisis then he is against the United States and the sooner he gets out of our country the better.

Do we realize that we are living in the most important age of all time? Do we fully appreciate that never in the history of mankind have the opportunities been so great for proving our ability to do great good? Are you measuring up to your opportunities? During the recent Third Liberty Loan drive there were many remarkably fine posters but one in particular had a head line which appealed very strongly to me. It was a simple question but it meant so much. It read—"Are You 100% American?" That does not imply race, creed, nationality or heredity. It is altogether possible for the individual who has just recently come from a foreign land and adopted this country to measure up to that standard fully as well or perhaps in some cases better than many who can boast of a long line of ancestors possibly dating back to the beginning of the history of our country. What constitutes our right to be considered good, 100% citizens of this glorious liberty loving country? No standard can be made that can be applied to all. In fact it would seem as though each one must answer this question for himself. What we accomplish by work—what we save by thrift or self-denial—what we give must all be reckoned by our ability and our opportunities.

It is not sufficient to have invested in Liberty Bonds for they pay splendid returns and represent the safest investment in the world. It is not sufficient to have taken a membership or to have given a few dollars to the Red Cross. It is not sufficient to have purchased thrift stamps for here again the purchaser has made a fine investment. What this country expects and should receive from all good citizens is work—good, hard work in whatever line we are best adapted for and where we can do the greatest good in helping to win the war. The individual who claims this country as his own

and is not willing to make any possible sacrifice for the good of his country needs to be born again.

Some time ago, one of our United States Senators—one of the big men of the country—said on the floor of the senate that there was not a sacrifice he wouldn't make for his country; that he would willingly lay down his life tomorrow if it would save his country. We should all feel the same way. If I could not subscribe to that statement, I could not believe myself worthy to be called a good American citizen. We must be willing to lay aside all of our prejudices and think first of our country. There should be no political division, no religious division, no race division but all should be working for the common goal.

The special activities which the dentists of this country can and should be doing to help win the war are so varied, so numerous and so all important that a mere mention of them would consume more time than I can devote to the discussion of this subject. I have preferred to talk on a few of the more general topics believing that a discussion of these all important points is what we most need. This does not imply that there are not very many important things for us to consider in our every day practice. Never in the history of our profession have we had the wonderful opportunities to prove our worth that are open to all of us today.

The element of waste in our offices of both time and materials is stupendous. I will just mention two items as examples of the waste of time. I believe that 75% of the time devoted to the treatment of pulpless teeth is purely wasted effort. When we know that practically all teeth, regardless of conditions, can be successfully treated within two or three days and then consider how most of them are treated week after week and month after month, we realize the amount of wasted effort.

Gold foil fillings properly placed are the best fillings at our command, and gold inlays properly made are good fillings but I venture to say that if the operator placed good amalgam fillings in 50% of the cavities filled with gold inlays he would have served his patients far better. If this is true the great bulk of the gold inlay operations is another example of wasted effort.

One might keep on almost indefinitely but I am sure the few points mentioned are sufficient to make us stop and think. If I have made myself clear, I am sure that we will all agree that every ship

that sails, every train that moves, every meeting that is planned should have "Winning the War" as the dominating idea of the event.

DR. EDMUND NOYES (Chicago):

Mr. President, Gentlemen, Members of the State Society: I congratulate you most sincerely upon the fact that our Program Committee has made this meeting to a great extent a patriotic meeting. These are times in which no company of men should ever get together without finding it a patriotic gathering, listening to patriotic sentiments and addresses. And it seems to me this paper is a most admirable one, and the admirable part of it I will not spend any time in talking about. What I wish especially to do is to express my emphatic dissent from what he said about universal military training. (Applause.) I also wish to make an additional suggestion, and that is in regard to the care of families of soldiers. The Preparedness League of Dentists undertook to make the drafted men of the volunteers fit to go into the service, also as far as necessary and there is given opportunity, to take care of them after they are in the service, but that is undertaken by the government to some extent. There are probably about one-half as many dentists under the government plan—one for each thousand soldiers—as would be necessary to keep their mouths in good, fair, healthy condition. There ought to be one for every five hundred. But this Preparedness League, I believe, does undertake a further service. It is a duty and a service that will be open more or less to every one of us in respect to such members of soldiers' families as are in need of our services and are not well able to pay for them.

Now, as to the other point. We all hope that after this war there will be a general disarmament to a reasonable degree, but, gentlemen, it may be a thousand years before the millenium will arrive. In the meantime until it does arrive, nations are not safe in this world if they are helpless. The fact that Switzerland has every one of her men thoroughly trained for military service is probably a very important reason why she has not suffered the fate of Belgium. That is the first point in favor of universal military training—that it will be a very long time before this world can do without police in civilian life and without armies and navies in national life.

The next point I want to make relates to the observation and experience of men generally in regard to the results of military training. I may be pardoned, perhaps, for two minutes of personal experience. I have five boys—four of them had military training in the cadet courses of the schools which they attended, and the value and benefit of it was immediately apparent in each case. Later two of my boys were in the Platts-mouth camp, with most emphatic beneficial results. I have not seen a man who has a son or near relative in a cantonment who has not expressed to me an emphatic appreciation of the physical benefit received in the military training as we are getting it now. In many cases the effect, besides being of physical benefit, is of moral benefit. I do not mean in the cure of viciousness—I mean in the increase of moral stamina and firmness and reliability. There is nothing that will be so valuable, in my judgment, to the careless and indifferent boys of this country, who have but little respect for law, who have but little thought for the rights, convenience, and welfare of the people with whom they are in daily contact, as military training. There is nothing that will do so much to make men fit for team work in the communities in which they live, and there is far too little of that in our villages and country towns everywhere in this country. The villages and country towns are not doing in a public way and by community team work one-quarter part of the things that they need to do in respect to their schools, their health departments, their fire departments, in respect to a great many other things that might be mentioned.

There is nothing that I know of that will so much help in the assimilation of our foreign born population and those of foreign descent as the association, the training, the friendships and acquaintances that they must necessarily make when they are all in cantonments for military training for a few months, where they must all be upon an equality, where the rich man's son must obey orders just as much as the poor man's son, where they must of necessity be in good fellowship and comradeship—there is nothing else in the world that will make good citizens out of our foreign born population so fast as that would do.

It is my belief that, economically, universal military training to a reasonable extent would be profitable. It need not be

anything like what is exacted in Germany—it need not take men out of economic employments to any very serious extent—but I believe that the moral and physical training that young men would get in that way by any sufficient military training would make them much more efficient in economic and civil life in the trades and professions which they will follow. I believe in this respect results would be obtained that in a commercial and financial way would far outweigh all the financial expense that would be involved in universal training. It is a good policy of public economy.

In my opinion, what we should do as soon as the war is over is to use the cantonments that are now being used for the training of soldiers for this war for this purpose of universal military training. The whole investment and outlay that has been made for this purpose can be made economically useful and profitable in this way. If we do not do something of that kind, the whole investment will be practically wasted as soon as we do not use it for this war.

DR. B. J. CIGRAND, (Batavia, Ill.):

I gave eight months of my time as Dental Director at the Grant Park Naval Training Station at Chicago, an appointive position, and was very glad to do it without any fees or salary. When I later took my promotional examination, they wanted to know how long I was volunteering for. I took a three days' examination at Great Lakes and volunteered for four years and received my commission.

I quite agree that while it may be essential to have considerable dentistry brought before the attention of this organization, it is absolutely proper and important that patriotism be given a primary place in this meeting. At no time in the life of any man present here was it so essential that patriotism should pervade his heart as now. I will be extremely brief in my remarks and will only mention in a topical way what I would like to speak about.

When I visited Europe I found that Germany was preparing for this war in this form—she was caring for the soldiers' teeth, and in order not to arouse the suspicion and curiosity of the public or the world at large, she said she was looking after the teeth of everybody. In order to take care of the rising generation of soldiers and blind the world and deceive the world and keep the world from being suspicious, she took care of the whole rising population of Germany.

But when we Americans in Europe went to visit those infirmaries in Strassburg, Hamburg, Berlin and Dresden, we found no opportunity to see what was transpiring. Germany has been working for years and centuries, with the one idea in mind, that her army is to rule the world. In 1688, The Leipzig University boasted, and it has been a German dream ever since, that the German language must rule the world and the kings of Germany must rule with it. This World's War is not a war of forty years' preparation or of a hundred years' contemplation but is the study and scheme of centuries; and it is most important to know that Germany was the first nation to learn that good teeth meant good health, and that good health is the basis of good soldiering, the all important Teutonic requisite. We allowed her to go on with all this preparation and did not pay any attention to it, and now we are learning a terrible lesson of preparedness by giving the lives of our best men. This is a time for patriotism, and other things can wait until the war is over, but now we want American patriotism. Saving teeth is important, but save America too.

We, as dentists, are all fighting an invisible enemy. The bacteria in the mouth is an enemy; the germs in the decaying teeth are enemies, and we are all enlisted in the great cause of bringing health and salvation to our own country, and any man in this gathering—but I know there are none such—but any man a member of the Illinois State Dental Society, who is blocking our national war policy or is a slacker for his country should be expelled from the organization. We have no time for slackers; for knockers; for fault-finders; be they Democrats, or Republicans; we have no time for these petty, selfish, narrow-minded groups. What we want are men who with drawn swords will stand for the great soul of America.

There is an old poem that says how impossible it is to please all, from the pen of Lorenzo Dow:

“You can, and you can’t;
You will, and you won’t;
You’ll be damned if you do,
And you’ll be damned if you don’t.”

Take your choice! It is said that the river that is dammed the most is the most useful river in the community. When opposition meets you, you generate power—if you are sincere and have an honest purpose, so go on and do the thing that you want to do and

let the fault-finders and knockers talk; do what is in your heart, loyal Americans, and now—this very day—serve your country's flag.

Wars are things that make men think under pressure, and this makes progress where under ordinary circumstances they might be idle, dormant or asleep.

We have so many men in our profession, such as Black, Swain, Koch and McManus, who have done so much for their country through their profession, and who locked their offices when the flag called; then we also know of another man, Dr. Benjamin Rush, signer of the Declaration of Independence, who recognized when he was serving in the American Revolution that the greatest thing that could come to the American soldier was good health, and that good health was founded on good teeth. Soldiers we must have while subnormal kings are ruling and so I believe most emphatically in universal military service. I know what great good the enlisting of our boys is doing in the country. I have no patience with that German lie—that they are going wrong. Last summer and for eight months I had supervision of the dental work for about 16,000 naval boys, and I know that absolutely every one of these boys walked better, looked better, felt better and was better because he was under the supervision of Uncle Sam; and all this talk about the demoralization of encampments and the loose way in which they are run is Teutonic echo, nothing more than the propaganda of Germany.

The American soldier is both the finest physical specimen, the highest moral example and in all the best behaved man that lives on the face of the earth today.

DR. G. H. HENDERSON, (Chicago):

I also rise to object to that statement of Dr. Harned and to say that universal military training is good not only for the young man, but good for the old men. I am no chicken, but I am proud to say that I am a member of Company L, 2nd Reserve Militia, of the State of Illinois, and if some of you old men would get out and hike eight or ten miles on a Sunday, and carry a rifle, you will all be better men. The man who objects to universal military training knows nothing about it. The thing to do is to get into a volunteer training corps, if there is no reserve militia in the vicinity. When our country went into war, there were eight regiments of the National Guard, but they were federalized. The State organized

three more regiments of the National Guard, but they were not enough to protect the people, and then they organized several regiments of Reserve Militia, and thank God for it. My uniform only cost seven dollars, but I would rather walk the streets of Chicago in that uniform than anything I know of. There is nothing puts pep into any man like getting into his country's uniform and serving as best he can. I am for universal military training.

DR. ALBERT M. HARRISON, (Rockford) :

As we were coming down on the train Dr. Harned said to me, "There is one point in my paper that will stir up a hornet's nest." He explained that it was the part about Compulsory military training for young men before they have reached the age of 21. I believe, as he stated, that one of the main ideas the United States has in this war is to end wars. As someone has expressively put it: "This war must end with an acceptable guaranty of an enduring peace, or every nation in the world must adopt preparation for war on the Prussian model."

I believe that military training of boys in high schools and colleges is advisable and is a splendid opportunity for teaching them alertness, instant obedience to commands, the importance of a healthy mind in a healthy body, the principles for which our democratic government stands, and to instill in their consciousness an earnest desire to live and work for our country's best interests, and if need should arise be just as willing to give life itself in defense of our country. I believe some provision must be made for the same training for the thousands of boys who never reach the high school, those who go to work because their parents claim their help, or more often because they resent the authority of the teacher, they are tired of school, they foolishly think they know enough, are quite sure they know more than their parents, in short they are quite able to do anything they wish, and most important in their opinion they intend to be independent, earn and have their own money; so they "get a job." Here is where the compulsory training should come in to keep these boys in school and give them the education and vocational training that will fit them for real service to themselves, their community, and their country.

I agree with Dr. Harned in not wishing to see America become a military nation along the lines adopted by the Germans. The insistent desire for military training and military service dominating

our young men today will cease when the need for such training and service has passed with the ending of this war. War is destructive, while peace is constructive, and peace has built us up as a nation.

Switzerland's methods of training her young men and making of them effective soldiers was commended by one of those who discussed the paper, yet the well trained Swiss army would have amounted to little more than an empty egg shell had the Germans wished to cross the Swiss instead of the Belgian line. Germany said: "We are the super men, might is right," and she has been sacrificing lives by the millions and money by the billions trying to give a practical demonstration of her assertion, and make the world believe it. But the war is not over yet, and the United States is going to help convince Germany that she has made a few mistakes, one of which was the claim that the mailed fist of the Kaiser meant: "MIGHT IS RIGHT."

MISSOURI STATE DENTAL ASSOCIATION, FIFTY-
THIRD ANNUAL MEETING, HELD AT COLUM-
BIA, MO., APRIL 1, 2, 3, 1918.

DISCUSSION OF THE ADDRESS BY DR. JOHN L. KIRBY ON "DENTISTS'
ASSETS AND LIABILITIES."

DR. GUY B. BAIRD, Fremont, Nebraska:

I know that Dr. Kirby is on the right track in a way; but I believe he is a pessimist, notwithstanding his claim of optimism, and you know you can't get very far with a pessimist. Dr. Kirby wants to jolly up a little bit and drive these clouds of pessimism away.

It is pretty difficult for the dentist to be jolly sometimes; the nerve tension he is under in conducting a practice of any volume is quite a strain, and I probably do not need to tell you ladies that. I have no doubt if I should ask a question of each of you separately, which I have asked my wife more than once, you probably would give the same answer. I have asked her, when by chance she would get married a second time, if she intended to marry a dentist. Guess what her answer was. "NO." I guess we agree on that.

While Dr. Kirby and I look at the business side of dentistry in the last analysis about alike, we get our conclusions

from a little different viewpoint. Dr. Kirby has many good ideas, some of which I have been able to assimilate myself to my advantage, as we have been pretty closely associated in this line.

One of the principal things that go to make a successful practice is efficiency. If a man is going to do a very extensive business he must be efficient; he must have ability; he has got to have something to sell, which in the case of the dentist is his time and ability. If a man has a great deal of ability he has a right to set a market price upon it commensurate with its value. If he hasn't a great deal of ability, he is not going to have a very big business. The reason we are attending this meeting is to try and increase our ability. That is the reason why dentists congregate together every year and sometimes two or three and four times a year and take that time out of their offices and away from their practice, to rest up and get ideas from other men. And I think it is a good plan for you ladies to come here and get some ideas from one another. You will find as a rule we are all about in the same class; we are all poor, but we are all kind. Speaking of being kind, reminds me of an incident. I spent the evening with a friend of mine in Iowa one night and took dinner with him, and his sister and mother-in-law were also present at the table, and I told them a story which was true, and I don't deny that I am rather ashamed of the part I took in it. My wife one day asked me if I would not go down the street about four blocks, in the evening, and get a loaf of bread. I said, "No, I will not do that; I will not add that responsibility to the other responsibilities that I have all day long, but I will give you twenty-five cents every evening, and if you want a loaf of bread you can hire a cheap boy to go and get it." I told that to this man's wife, and she has in time forgiven me, but the mother-in-law doesn't like to hear my name mentioned. But really that was no joke, when you stop to think about it. When a man is busy all day with serious matters, with that little added responsibility, something he has got to do, and about four o'clock in the afternoon he begins to wonder what that was his wife wanted him to bring home, and he is just as apt to go and get a quart of milk. I have a general manager. When I get home my wife goes through my pockets to see if there is anything that I was to bring home, that my assistant had sent home;

and likewise in the morning my assistant goes through my pockets to see if there are any letters to mail or what not. I have to be started at each end.

At a meeting of the retail merchants' association in our town, of which I am a member, because I am also a retail merchant, a banker was explaining a new credit system they were trying to organize in this country, similar to the one they have in England and France and some of the other foreign countries.

I do not know whether it is going to be worked out, but think it might be a good thing. Whenever anyone goes into a store or place of business and buys an article on credit, the storekeeper presents a little blank certificate, which is filled out with the name of the article or articles and the price to be paid. This is probably in the form of a promissory note: "For value received," etc. I promise to pay so much. This is turned over to the bankers and the merchants, if he desires it, can cash it the same as a note; if it is not paid within ten days or thirty days a certain per cent of interest is added. This might be a good system for dentists to adopt, as the dentist usually has to do business quite in a different way from a bank. Instead of getting interest on his loans of time and expensive material, he loans his money and not only does not get any interest but sometimes doesn't get even the principal.

If a patient comes to my office and wants some work done, I will inform that patient as to what is necessary and what the cost will be, and he or she will naturally think it over. I might illustrate: Say that I take a notion I want an aeroplane. I would go to a place where they were selling them and I might be told they could sell me a good one for \$250. I would not know anything about planes, just wanted one because somebody else had one. I would later meet a friend who had a plane and ask him what he paid for his. He would tell me he had paid \$1,000 and that he knew where I could get one just like it for \$1,000. Which one of those machines do you suppose I would buy? People think of those things, when they go to a dental office. If they are discriminating people they want the very best service they can get. If you were going to have some work done, you would go to the man you knew was a good man and be willing to pay whatever his service was worth. The question is, what is the

basis of our charge? We must know something about the cost and this is not a difficult matter to figure if you will keep a record of the time you spend at the chair; when the year is completed you will find that you have put in from 1,000 to 1,100 hours' work at the chair. This is your earning time, that is to take care of all the rest of the time, amounting to another 1,000 hours; and by making this calculation of what it costs you per hour to do business, it is an easy matter to ascertain what operations are worth. That is, I mean, when you give honest service. There are many operations performed that are a detriment to the person who is subjected to them; but I know you men are not that kind of operators. We have them, I will admit, up in Nebraska, but I never heard of one in Missouri.

As to your investment in equipment, I will take some figures I made six years ago in my own practice. My office equipment figured out about \$1,670, at the present time, the same equipment would figure almost twice that. I do not really know what the exact figures would be. You know, we sometimes have to look at this in the face, when it comes to figuring. There is a natural depreciation in your equipment, which we will say amounts to 10 per cent, a rather smaller figure than would cover the actual conditions, but easily calculated; this gives you a yearly loss of \$167. You have invested in your education in the three years at college, we will say \$3,000, estimating that if you were engaged in some ordinary business occupation you would be able to earn at least \$1,000 per year. This mental equipment is an asset while you are alive, but it dies with you and does not add anything to your estate. We can refund this expense, at about 4 per cent, which would amount to \$120 per year, for say 25 years, so that on your total investment, in physical and mental equipment of \$4,670 you must figure a yearly interest of \$117 on equipment, \$120 on mental capital, which, with the \$167 as depreciation on office equipment, would require us to carry about \$400 a year as a serious charge against your business. I am not going into the overhead expenses in detail. You have your telephone, gas, electricity, salary to assistant, commission to assistant on bills that are slow in collection, and various incidentals which go to make up quite an amount during the year. Then I figure an individual salary of \$2,400, and add-

ing that to all the expenses charged against the business, makes a total expense to be levied against your office of \$5,432.22, as I have compiled the figures. That seems to be quite a sum; and that is to take care of that interest debt, refunding debt, and the depreciation, together with the salary of \$2,400, and this sum of \$5,432.22, you have got to make just to come out even.

As I stated before you figure about 1,000 hours earning time, and another 1,000 hours aside from the work at the chair. We lose about 50 per cent of this time in different ways; explaining examinations, broken appointments, conversation, charity, and idle time. The total loss of time will cut down our actual available earning time to about 1,073 hours. We must also take out several days in each year. Sundays, national holidays, vacations during the hot summer months, dental conventions and so on, so that we actually have but about 1,100 hours in which to make that \$5,434.22, which comes pretty close to \$5.00 an hour, which we have to make in order to cover the items above enumerated, really about \$5.48 an hour. We must charge more than that for our earning time, but that is the figure upon which we can base our fee and find out really where we are at. That is the only way that I know of by which we can figure such a basis, and when we get an idea of what it costs us to do business, we will begin to figure out how we can increase our gross business and also our net returns.

The only way you can do that is to take an inventory of everything you have in your office and keep an account of your time. You can begin your fiscal year any time. You do not have to wait until the end of the year, or the beginning of the new year. You can start in today or tomorrow, and I am quite sure, if you will do this, you will feel repaid for the time spent.

There is a legitimate business side to the practice of dentistry. If there was not, and if a man's services are not worth anything, we had better let the profession go by default, and get in something else.

I was talking to a dentist the other day, who two years ago had sold out his business. He had gone into a small farming business, and one item he mentioned was last year he had 40 acres in beans, which produced 20 bushels to the acre, and netted

him \$5.00 a bushel, which looks like a pretty good return even for the average dentist.

I believe that there has come a time when dentistry is getting to be appreciated to its full extent. There has never been a time when things looked better for our profession than at the present, and if you render good service, you can rest assured you are going to prosper.

DR. KIRBY (closing): I want to say that at no time do I ever depreciate the value of efficiency and good service; the best service that it is possible for a man to render; and at no time do I put the business side ahead of the service. If you will notice, I have only asked you to spend one-half hour a day, ten hours in the month of 20 working days, against 90 hours of professional service, and I want to tell you if you spend 10 hours of your month to increase your business efficiency, you will give 900 per cent better efficiency in your professional work. No man can be in condition to give good professional service when the collector is chasing him to get last month's rent.

I don't want your husband to cut his efficiency down; I want him to be a better dentist. I want him to get more thorough professionally, but I want him to use just about ten per cent, the tithing system, if you please, applied to his business, and you will all be driving an electric with that extra money he has made.

BANQUET.

PRESIDENT DAYTON DUNBAR CAMPBELL, Toastmaster:

I have in mind a boyhood experience that occurred in the Ozark Mountains in southwestern Missouri when I was eleven years old. There one day I met a fine looking fellow, who, I learned, was a dentist. Afterwards I found this man to be very courteous and kind-hearted and of many talents. He was my inspiration to study dentistry and later I became his office boy, and as years rolled on, whenever he found occasion to do some nice things for me he always did, even going out of the way to do them. He always gave me an encouraging word and a friendly lift. So this evening, when I called his room asking if he was ready to come down and was dressed, he replied that he was, and you see the results. And when my good Scotch friend, Gallie, came down also, dressed as you see

him, you can imagine my disappointment, because I fully expected he would come here in his plaid and kilties, with his bag pipes over his shoulder ; so I cannot introduce him as I should like to ; but I am going to ask my preceptor of years ago, Dr. Burton Lee Thorpe, to introduce the guest of the evening. (Applause.)

DR. BURTON LEE THORPES

Mr. President, Dr. Gallie, Ladies and Gentlemen: I don't mind confessing I have a drop of "Scotch" in me myself. For years I have had occasion to be proud of my early association with Dayton Campbell. As a lad he was a good boy. If you want a thing well done leave it to him. He has illustrated the saying, "If a man can obey orders he is fit to command." As a boy he was a mechanical genius. After the "Maine" was sunk he reproduced an exact duplication of it, in miniature. In the years of our acquaintance he has done well in all things he has attempted, except one—he is about the rottenest golf player I ever knew. Knowing then and realizing it better now that at that time I had little knowledge of the art and science of dental surgery, I doubt if Dr. Campbell learned much of merit as far as technical knowledge is concerned in his boyhood association with me, but I have been proud to hear him say on various occasions he did absorb from me two things as equally essential in conducting a successful practice as is technics, i. e., courtesy and cleanliness. This young man who came from a small beginning has known "the pinch of poverty and the clutch of debt," has made for himself an enviable reputation, greater by far than any other man I know of from the Ozark country. One of the greatest fallacies of this life is the saying, "It all comes to him who waits"; that is not true—it's not the dreamer or the drone who waits that succeeds, but he who works to prepare himself that he be ready to accept the opportunity when it knocks at the door. When a boy, Abraham Lincoln said, "I will read and study, and maybe my chance will come," and that was the secret of his success—preparedness. Dr. Campbell has been a doer of things that exemplify the inspiring words of Berton Braley, entitled

OPPORTUNITY.

"With doubt and dismay you are smitten,

You think there's no chance for you, son?

Why, the best books haven't been written,

The best race hasn't been run;
The best score hasn't been made yet,
The best song hasn't been sung;
The best tune hasn't been played yet,
Cheer up, for the world is young!

"No chance? Why, the world is just eager!
For things that you ought to create;
Its store of true wealth is still meager,
Its needs are incessant and great;
It yearns for more power and beauty,
More laughter, love and romance;
More loyalty, labor and duty;
No chance—why, there's nothing but chance!

"For the best verse hasn't been rhymed yet,
The best house hasn't been planned;
The highest peak hasn't been climbed yet,
The mightiest rivers aren't spanned.
Don't worry and fret, faint hearted,
The chances have just begun.
For the best jobs haven't been started,
The best work hasn't been done."

(Applause.)

It is fortunate that I am not to make a set speech—but only a few remarks of introduction—for the reason for the past two nights I have suffered for the first time in my life with what every dentist should experience, i. e., a well-defined peridental abscess. I assure you Robert Burns' "ode to the toothache" is mildly put, for it is all and then some to what General Sherman said war was. Besides that, the president appointed me as host to our distinguished guest. The host, as you know, usually is the man who pays all the bills, but being host to a distinguished guest is different. Your duty to him is to carry his grips, put the buttons in his dress shirt, tie his cravat and sleep with him, even if he snores—as Dr. Gallie does. (Laughter.)

These foregoing disturbances made me call to my aid all the philosophy I possess and I feel like the incident told by Major Maclean Watts in his book, "The Heart of a Soldier." A captain

in the artillery saw an Irishman lying on his belly out in front of a trench in the mud pumping five hundred shots a minute from a machine gun into the Boches. Noting the wonderful bravery, he crawled out to the gunner and sympathetically said, "Oh! Pat, this war is hell, isn't it?" Pat saluted and replied, "Sure Mike, but isn't it better than no war at all?" (Laughter.) Under the circumstances I feel possibly any remarks I make will be better than none at all.

There are several things I feel should be mentioned by someone, for it is only right the proper credit should be given when it is due. My criticism of you is your reticence to give praise for deeds done. You know we have a wonderfully efficient state board and most effective state law, as a result our state is freer than ever before of advertising dentists. This law was passed at the last session of our assembly and the man who deserves the greatest praise for the good work he did in securing its passage left his home here in Columbia, went to the capitol at Jefferson City, where he worked for twelve days and nights to put this law over. This he did with the aid of others. His name is Dr. Charles W. Digges. (Applause and cries—"Digges—he is all right.") Incidentally I wish to remark he is the type of man this association is proud of and should promote as an evidence of its appreciation. (Applause.)

There is another man who has done good work, not only for St. Louis, but for the profession of our state. You all appreciate the magnificent monument to humanity founded by the Forsythe Brothers at Boston and a similar institution founded by Mr. George Eastman of Kodak fame, at Rochester, New York. These institutions have had a far-reaching influence in spreading that gospel which you and I and every right-minded dentist in all christendom is trying to preach and practice in the endeavor to instill the great principles of oral hygiene and prophylaxis in the minds of the lay people. A St. Louis dentist recently, through his enthusiasm for the cause, interested his patient—Mr. George Meyer,—a banker, who now is the financial backer of a much-needed school clinic in the city of St. Louis, and the dentist who brought this about is your vice-president—Dr. H. F. D'Oench.

To me it is a very great pleasure to have this opportunity of introducing the guest of the evening, whom I have known many years, but never have known him to stand for anything except the

highest standard in dentistry and in the affairs of life. It is well you should know some of the things he has stood for in the past: Member of the Illinois State Board of Dental Examiners, president of the Chicago Dental Society, president of the Illinois State Dental Society, president of the Institute of Dental Pedagogy, president of the National Dental Association, 1915; supreme grand master of the Delta Sigma Delta Fraternity, 1916; professor of operative dentistry, Dental Department, University of Illinois, and a dental member of the Medical Board of the National Council of Defense. He has, as you all know, acquired quite a reputation of late as a patriotic speaker. Last week he was out five nights speaking at banquets and other affairs. Since his boy has joined the colors there is no one at home except Mrs. Gallie, who is one of the foremost members of the Federation of Women's Clubs. Besides being parliamentary, she is a very diplomatic and tactful lady. So, to make Dr. Gallie feel at ease when he is home for dinner, she invites several of the neighbor children in to join them. After the dinner is finished, she arises, assumes the place of toastmaster and says, "Children, Ladies and Gentlemen: I now have the pleasure of introducing a celebrated orator, who will present his views on the world war." Then the children applaud and Don feels at home. (Laughter.) That's what we want him to do tonight, and we bid a most cordial Missouri welcome to our guest, Dr. Donald McKay Gallie, of Chicago, who will now address you. (Great applause.)

(Dr. Gallie's address appears on page 885 of this issue.)



THE DENTAL REVIEW

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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THE RELATION OF INDUSTRY TO THE COMMUNITY.

Until recently dentistry acknowledged no real relationship between itself and the community. This does not mean that dentists are lacking in philanthropic spirit, or that they are selfish, or that they are not as willing as other men to sacrifice themselves for the public good. It means two things—first that the community was not educated as to the significance and value of dental service, and therefore did not welcome advances made by dentists toward community effort, and second that the nature of dental practice is such that sustained voluntary dental service cannot be maintained for any length of time. Medical men find it profitable to serve in free dispensary work not only for the experience which it brings but because it extends their acquaintance and adds to their reputation. This is not true to the same extent of dentists. Free service costs the dentist more in every way than it does the medical man, and it never leads to subsequent desirable private practice. It is time practically lost, and must always be charged up to pure philanthropy.

But in spite of these handicaps the vital relationship of dentistry to the community is daily being demonstrated in various ways. Public school dental clinics are scattered from one end of the land to the other, and industrial dentistry is assuming much importance. The fact is being slowly but surely forced on the public officials such as boards of education, city councils, principals of schools, and others having within their keeping the welfare of the rising generation, that dental service has a direct bearing on the bodily and mental development of the child, and in the case of industries the heads of big industrial organiza-

tions are rapidly learning that to properly care for the teeth and mouths of their employes is of distinct economic advantage.

The establishment of the Forsyth and Eastman institutions has done much to impress upon the country at large the benefits of dental service to the children, and it is safe to assert that the attitude of the community generally toward the question of oral hygiene has greatly changed within the last decade. Never has the public been so willing as it is now to listen to instruction in this line, and never has the profession been put to so keen a test in meeting the situations resulting from this instruction. As the significance of our service rises in public esteem, just to the same degree does our responsibility increase. Members of the profession must recognize this fact and must personally and collectively divest themselves of the swaddling clothes of individualism and self-interest, and accept the widened horizon of a community and philanthropic point of view.

The nearest approach to this in my opinion is the Preparedness League of American Dentists. Initiated as a war measure through the foresight of Dr. J. W. Beach, it has extended its usefulness to such a degree that its work has been recognized by the War Department through the Surgeon General's office, and by the Red Cross, in a manner to constitute it an integral part of the great war machinery of the nation. The performance up to date of more than half a million free dental operations for our prospective soldiers is an achievement never before equaled in philanthropy by any body of dentists in the history of the world, and the fact that this service has been so universally extended through all of the States makes it a representative movement of the profession generally, and constitutes itself a real endorsement of the philanthropic spirit of the dentists of this country. The spontaneous response of the members of our profession everywhere to the appeals of the League in rendering free service to the recruits proves conclusively that the spirit of selfsacrifice was not lacking among our members, and now that the habit of thought of dentists has been turned in this direction we may confidently look forward to even greater things from them in the way of community effort.

But what shall we say of the relation of the dentist to the community after the war? We are all wrought up at this time

with patriotic fervor developed largely by the exigencies of the greatest war humanity has ever faced. Selfsacrifice is the dominant note of the hour, and it is relatively easy to appeal to the nobler side of our natures. We willingly do things which under ordinary circumstances in peace times we could not be induced to do, and yet if we are to get any real lasting benefit from the war, it must be along the lines of a spiritual awakening which shall make of us men of selfsacrifice in times of peace as well as in war. Unless we can take out of our consciousness the narrowness and selfishness of the past and plant in their places the perpetual flowers of philanthropy and community weal, we shall fall short of profiting permanently by the war or coming fully into the heritage which today is so freely ours for the asking. May we hope that when the time comes we shall not be found wanting.

THE EDITOR'S DESK

RESPECT THE RIGHTS OF OTHERS

This is the hardest lesson in life to learn—and the most important. If it could be learned by everybody the machinery of human affairs would move more smoothly. To respect the rights of others is fundamental. It starts at the very basis of justice in all the dealings of life. It is elemental, because it is the first law in the intercourse between man and man. Why do we find it so difficult to learn this lesson? It is all answered in a single word—it is selfishness. The man who comes the nearest to getting selfishness out of his heart comes the nearest to being a full-fledged man, and the nearest to respecting the rights of others.

To put yourself in the other man's place is the one sublime achievement. To sink self in the common cause and realize that you are only one atom in the great moving mass of humanity is to get the right perspective, and to place your feet on the solid rock. When a man deals unjustly with you, stop and think. Try to see his point of view, and mayhap you will find that he is not so unjust as you had thought. Even if he is unjust, give him the benefit of believing that he does not realize it. If neces-

sary to correct a wrong that he has done, approach the problem with charity and loving kindness, and not with a bludgeon in your hand. To knock a man down is not to convert him to your way of thinking, but to give him the pretext for knocking you down in return. Neither one is benefited thereby and both are injured. If a man will not reason with you, let him alone. If you cannot convert him do not condemn him. If you cannot make him think as you think, remember that every man is given the inalienable right to think for himself, and you should not be insistent in forcing your point of view on others.

You cannot reason with a venomous reptile, but you can respect his rights and keep out of his way. If he gets in your way and impedes the progress of a legitimate pursuit in which you are engaged, you may be obliged to suppress him for the common good, but you should do it for the good and not for vengeance. To kill a snake through wanton malice is to suffer defeat of principle, and to acknowledge the inferiority of your soul. It is not well to permit yourself to be bitten—the equity of justice does not call for that—but better be bitten a thousand times than to go about through life ruthlessly trampling on the rights of others. You may be bitten and survive, but you cannot save your own soul if you wilfully and persistently force your opinionated beliefs on your fellowman.

Remember, you were not born to sway the world. You will do well if you sway the one small sphere in which you revolve yourself, and you may consider it a triumph if you succeed in controlling your own individuality. Men will accord you your own rights more readily if you respect theirs, and the poorest man is he who seeks constantly the happiness of others. There is room in the world for all, but he who tries to crowd others off the earth is quite likely to be pushed over the brink himself. It is the inexorable law of "like begets like," which when once learned as it applies to our relations with each other, will bring about the moral millenium. Think of your fellowman as if he were your own brother in blood, and accord to him the same right to live and have his being as you demand for yourself. In this way, and this way only, can you move on into that higher achievement which is the ultimate of all our earthly efforts.

BOOK REVIEWS

THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE MOUTH.
By ARTHUR HOPEWELL-SMITH, L. R. C. P., Lond.; M. R. C. S., Eng.; L. D. S., Eng.; Professor of Dental Histology, Pathology and Comparative Odontology, University of Pennsylvania, etc. Second edition, revised and enlarged. With 394 illustrations. 477 pages. Price \$4.50. Published by P. Blakiston's Son & Co., Philadelphia.

This is volume II of this splendid work and deals with pathological histology. For one interested in this subject it is a fascinating book to pick up and study. Of the illustrations 343 are from original photographs and photomicrographs made by the author and the illustrative features of the book are worthy of all praise. Some of the cuts in the chapter on Dental Caries are particularly fine, as well as those illustrating odontomes. The book is worthy of all praise and no dental library is complete without it.

THE SURGERY OF ORAL DISEASES AND MALFORMATIONS, THEIR DIAGNOSIS AND TREATMENT. BY GEORGE VAN INGEN BROWN, D. D. S., M. D., C. M., F. A. C. S., Major Medical Officers' Reserve Corps, U. S. Army, Oral Surgeon to St. Mary's Hospital and to the Children's Free Hospital and Columbia Hospital, Milwaukee; Fellow of the American Medical Association; Member of the National Dental Association; Chairman of the Section on Oral Surgery of the Fourth International Dental Congress, etc. Third edition. With 150 engravings and 20 plates, and a selected list of examination questions. 734 pages. Price \$7.00. Published by Lea and Febiger, Philadelphia and New York.

Naturally, the greatest change in this splendid work for the present edition relates to war surgery. The author has studied carefully the latest methods in vogue in the restoration of lost parts torn away in trench warfare, and has brought together a comprehensive system of treatment. The same commendation of the work as a whole may be made as was given the earlier editions when they appeared. The publishers have combined with the author to bring out a work which will be a credit

to the profession, and a great aid to those who are interested in this particular line of practice.

PRACTICAL HINTS

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to THE DENTAL REVIEW, 810 Masonic Temple, Chicago, Ill.

Root-Resection:—Should not be attempted if the bone is absorbed over more than the apical third of the root, but such a tooth should be extracted and the socket curetted.—*Earle H. Thomas, Chicago, Ill.*

Receptacles for Burs, etc.:—The small tin boxes that the Eastman dental X-ray films come packed in can be fitted in a drawer in your cabinet and make a splendid place for keeping your stock of burs, having each labeled so you can tell at a glance of what your stock consists. These boxes also are quite convenient for sand-paper disks, etc.—*E. T. Evans, Decatur, Ill.*

Access:—Get access to the canals of the tooth without spoiling the crown thereof for a good filling or inlay, above all, *get access* and don't waste hours of time and perhaps fail in the result by trying to look around or work around a corner of the tooth. The most important part about a pulpless tooth is to get at the canals so you can treat and fill them thoroughly.—*W. O. Fellman, Oak Park, Ill.*

Supernumerary Teeth:—Woman about 35 appears for the extraction of a supernumerary tooth lying lingually to the upper third molar. She has already had *eight* teeth taken from the same place. I extract the *ninth*. A well developed third molar remains. On the other side of the mouth she has a well developed third molar, with two supernumeraries to the lingual of it. These teeth are about the size of a deciduous first molar. They have one root. They all have enamel dentin, cementum and pulp.—*E. J. Perry, Washington, Iowa.*

Tempering Explorers:—Heat one of your flask bolts to a cherry red and at a point $\frac{1}{4}$ of an inch from the sharp point of your explorer lay it on your red hot flask bolt. Watch your steel instrument very closely. It will first turn to a light straw, then darker until it gets a beautiful pigeon blue. Then the instrument should be immersed in water and the temper is perfect, the point will not rust. I prefer the tip end of the point to be a straw color. When you want to make a sharp angle, hold the instrument in the flame and bend at a red heat.—*Y. E. Whitmore, Little Rock, Ark.*

A Most Effective Styptic:—The most effective styptic known to the writer, for obstinate cases of hemorrhage after the extraction of a tooth or root, i. e., cases that will not respond to the more usual remedy such as adrenalin, will be found in the formula of Dr. J. P. Buckley, known as Phenol-Sulphonic Acid. A pellet of cotton wet with the acid and inserted into the root socket will cause an almost instantaneous cessation of hemorrhage without causing any discomfort to the patient, and will be found to be perfectly harmless even if left in the root socket for twenty-four hours.—*H. A. Cross, Chicago.*

Simple, Accurate Technique for Making Gold Saddles:—Fit 28 gauge casting wax to model with thumb and fingers under warm water, trim to outline. Now take inlay wax and flow a light rib along crest of ridge from one end of saddle to the other and one on each side from crest of right at one end to margin of saddle half way to other end. These ribs form gates for the gold when casting and serve as reinforcements to wax pattern as well as the finished saddle.

For vulcanite attachment fit a piece of 20 gauge clasp wire bent up and down so as to form loops near margin of saddle; heat in flame and stick to place on wax pattern. By fitting the wax under warm water and chilling with cold air or water, it can be easily removed without danger of distortion. Attach sprue wire to end and flask lengthwise.

A piece of brass or iron tubing of proper length and size—a tin can lid with two or three layers of wet blotting paper and a good blowpipe is all that is necessary for doing the casting.—*F. E. Roach, Chicago.*

Small Pit Cavities:—Since the general adoption of the gold inlay many of us have been puzzled as to how to deal with the small pit cavities such as are frequently found in the occlusal of upper molars, and in the buccal of both upper and lower molars. Cavities of this class may be easily and satisfactorily handled in the following manner: With a fissure burr drill a perfectly round hole of sufficient depth and diameter to remove all frail enamel and softened dentin. Take a suitable round sprue wire from some previous gold casting and fit it to this round hole. (It is, of course, best to start with a wire that is a trifle too large and trim it to exact size by placing in a pin vise and slowly filing down until a suitable fit is obtained.)

With this wire in the prepared cavity, carefully mark with a sharp instrument the point at which it is level with the tooth surface. Remove and with a saw or a sharp stone carefully cut the wire until it is almost severed. Set this prepared wire with regular inlay technique. After the cement is hardened break off the protruding end with a pair of pliers and you have in the cavity a well fitting inlay that has required no model, that has not been difficult to handle and that will give service as long as any known dental operation. (Of course, the final grinding and burnishing should be employed as in any inlay restoration.)—*Arthur G. Smith, Peoria, Ill.*

MEMORANDA.

DR. LOUIS SCHULTZ NOT IN SERVICE.

In the list of members of the Illinois State Dental Society in service, as given by the secretary, appears the name of Dr. Louis Schultz. We are requested by Dr. Schultz to make a correction to the effect that he is still in his office, and has not been called into service.

NOTICE OF THE ANNUAL MEETING OF THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

The Annual Meeting of the Dental Protective Association of the United States will be held at the Palmer House, State and Monroe Streets, Chicago, on the third Monday of December, the 16th, at 4 P. M., sharp. The report of the officers will be given; a Board of Directors will be elected, and such other business transactions as should come before the Association. All members are urgently requested to be present. By orders of the Board of Directors: J. G. Reid, president; J. P. Buckley, vice-president and secretary; D. M. Gallie, treasurer.

SELECTIVE SERVICE COMMITTEE, CHICAGO ASSOCIATION OF COMMERCE.

The Chicago Association of Commerce has created a Selective Service Committee to assist its members and the district boards in the difficult task of reviewing industrial deferment claims. These committees will also lend

their assistance to non-members who wish to avail themselves of this service. The undersigned committee, to whom matters concerning physicians, dentists, osteopaths, optometrists, hospitals, sanitariums, X-rays and pathological laboratories may be referred, holds regular meetings daily at 5 p. m., at the office of the chairman, Dr. Martin M. Ritter, 1819 Marshall Field Annex, from whom blanks covering information may be obtained. Should you have occasion to require the services of this committee, you may present your claim at the time and place above mentioned. Further information may be obtained by calling Central 2964. Yours very truly,

Dr. Martin M. Ritter, Chairman.
 Dr. Cassius C. Rogers.
 Dr. Noble M. Eberhart.
 Dr. Chas. H. Dodge.
 Dr. Fred W. Gage.

PATENTS OF INTEREST TO DENTISTS.

- 1214556. Sanitary tooth brush, Nate Le Vene, San Francisco, Cal., and A. Fee, Chicago, Ill.
- 1215087. Attachment of dental manikin heads to the patient's head-rest of dental chairs, Faneuil D. Weisse, New York, N. Y.
- 1216107. Artificial tooth, Thomas F. Glenn, Ardmore, Pa.
- 1215678. Filling material for teeth, Missak Marouke, Louisville, Ky.
- 1216159. Knockdown tooth-brush, R. R. Oldham, Laurel, Wash.
- 1215442. Orthodontia appliance, Wm. E. Walker, deceased; J. M. Walker, New Orleans, La., administrator.
- 1216284. Tapping machine, Arthur W. Cash, Decatur, Ill.
- 1216285. Regulator for anesthetic apparatus, Arthur W. Cash, Decatur, Ill.
- 1216683. Implanting artificial denture roots, Edwin J. Greenfield, Wichita, Kans.
- 1216311. Dental brush, Henry T. Hartman, New York, N. Y.
- 1216625. Controller support for dental chairs, Samuel D. Strohm, Philadelphia, Pa.
- 1216375. Attachment for dental engines, Alexander Sved, New York, N. Y.
- 1216514. Dental pliers, Samuel J. Symmons, Oakland, Cal.
- 1217403. Dental tool, John H. Brown, Midvale, Utah.
- 1217866. Artificial tooth, Otto G. Hess, Los Angeles, Cal.
- 1217779. Dental floss holder, Roy C. Kleckner, Indianapolis, Ind.
- 1217206. Dental mold unit, Clinton A. Nixon, Valparaiso, Ind.
- 1217374. Orthodontia, Wm. E. Walker, deceased; J. Mort Walker, New Orleans, La., administrator.
- 1218078. Artificial tooth, Isidore Goldman, Leeds, England.
- 1218178. Articulator, Rupert E. Hall, Philadelphia, Pa.
- 1218289. Artificial denture, John A. Maker, Duluth, Minn.
- 1218779. Manufacturing artificial teeth and other articles, Walter W. Crate, Camden, N. J.
- 1218989. Artificial tooth, Leo E. Evelin, New York, N. Y.
- 1219019. Artificial tooth and mounting of same, Edwin W. Magnus, Sydney, Australia.
- 1218680. Matrix broach-molding device, Andrew E. Markwell, Fort Worth, Tex.
- 1219147. Tooth-brush, Alphonse A. Picard, New York, N. Y.
- 1219710. Vacuum casting device for gold-inlay work and the like, Frank B. Davis, Johnstown, Pa.
- 1219986. Dental-floss holder, Wm. M. Muchow, Evanston, Ill.
- 50471. Design, mortar, Frank L. Grier, Milford, Del.
- 1220933. Dental scaler, Thomas F. Bates, Shelbyville, Tenn.

- 1220409. Dental floss holding device, Alfred Freschl, Detroit, Mich.
- 1220239. Artificial tooth, Edward F. Klumb, Chicago, Ill.
- 1220658. Abrading and polishing strip holder, E. J. Maloney, Long Island City, N. Y.
- 1220252. Dental implement, Austin Matthews, Hardy, Neb.
- 1220669. Cusp-diagram mechanism, Frank E. Miller, New York, N. Y.
- 1221420. Denture, Robert M. Craig, Wilkinsburg, Pa.
- 1221586. Dental floss holder, Arthur W. Powell, Taylorville, Ill.
- 1222267. Saliva ejector, Albert B. Cosad, Piedmont, Cal.
- 1222377. Identification device for tooth-brushes and the like, Bradford B. Flint, Saranac Lake, N. Y.
- 1222203. Dental occluding frame, Rupert E. Hall, Houston, Texas.
- 1222144. Dentifrice, Wm. M. Ruthrauff, Chicago, Ill.
- 1222773. Composition for making dental impressions, Herbert H. Kreutzmann, Hillsboro, Wis.
- 1223364. Artificial tooth, Rutherford H. Bowsher, Adelphi, Ohio.
- 1223450. Artificial denture, George L. Van Allen, Prince Bay, N. Y.
- 1224740. Rotary tooth-brush, John C. Green, Burwell, Neb.
- 1224395. Dental apparatus, Wm. T. Lyon, Portland, Oregon.
- 1224195. Artificial tooth and making same, Edwin Mountford, York, Pa.
- 1224490. Mold for making artificial teeth, Edwin Mountford, York, Pa.
- 1224203. Belt, Felix A. Patten, Cleveland, Ohio.
- 1224687. Mold for making dental-crown dies, Samuel W. Taliaferro, New York, N. Y.
- 1224696. Antiseptic tooth-brush holder and sterilizer, John D. Wise, Jackson, Tenn.
- 1225230. Rotary tooth-brush, George N. Elwin, Victoria, Canada.
- 1225362. Dentifrice, Wm. M. Ruthrauff, Chicago, Ill.
- 1226457. Dental tray, Evan A. Brown, Tacoma, Wash.
- 1226482. Rotary tooth-brush, Wm. J. Dossey, Glasgow, Ky.
- 1225955. Rotary tooth-brush, John Hickman, Tangleflag, Canada.
- 1226232. Dental cement, Joseph E. Mahan, Swissvale, Pa.
- 1226556. Matrix molding device, Andrew E. Markwell, Fort Worth, Texas.
- 1226557. Matrix molding device, Andrew E. Markwell, Fort Worth, Texas.
- 1226382. Artificial tooth plate, Lucius Robertson, Cincinnati, Ohio.
- 1227104. Blowpipe, James Aslin, Providence, R. I.
- 1227031. Toothpick holder, Thomas Bartholomew, Columbus, Ohio.
- 1227412. Tooth-brush, Adam E. Fendrich, Weehawken, N. J.
- 1227277. Burner for dental furnaces, Charles H. Land, Detroit, Mich.
- 1226799. Sanitary tooth-brush holder, Harold G. Olena, Brooklyn, N. Y.
- 1227073. Anchor for dental plates and the like, Finis E. Roach, Chicago, Ill.
- 1227324. Airheater, Percy Russell, Brooklyn, N. Y., F. J. Sepas, Philadelphia, and E. B. Wilford, Marion Borough, Pa.
- 1227207. Dental tool, Otto Schwalb, Jersey City, N. J.
- 1227602. Artificial teeth, Ernest Fogg, Newcastle-upon-Tyne, England.
- 1228124. Dental waste receiver, Charles Metzler, Cincinnati, Ohio.
- 1227687. Dental tool, Victor Stoll, Brooklyn, N. Y.
- 1228261. Tooth-brush holder, Joseph J. Taylor, Richmond, Va.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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THE DENTIST'S INTEREST IN CONSULTATION WORK WITH REFERENCE TO ORAL MANIFESTATIONS IN GENERAL SEPSIS, TUBERCULOSIS AND DIABETES.*

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO.

As many of you probably know, the past few years have found the author engaged in studies involving immunology and of course primarily in that part of it which relates to oral infection. These studies have carried him into various lines of research and he finds that he has been sufficiently compensated for the time spent by the pleasure and interesting experience which he derived from it. As a result of the pursuance of that work he has occasionally come into association with physicians and many times with dental confreres, in diagnosing and prognosing cases where dental infections were supposed to be the etiologic factors or associated factors to bodily disease. In order to gain the respect and good will of our medical friends it is essential to be well versed in medicine generally, at least, as far as pathology is concerned. The ability to properly interpret X-ray pictures and symptoms of mouth troubles, together with facts elicited from personal history is, of course, very necessary and to master all these things is rather a large order. The writer has felt after meeting professionally with many of his dental confreres that speaking of them as a class he must admit that their knowledge of general pathology has at times impressed him as wanting, and therefore when your worthy chairman of the program committee asked him to say something to you at this meeting he felt that if he could start the ball rolling by repeating to you some of the pathology of diseases which frequently are mentioned in

*Read before the Illinois State Dental Society, May, 1918.

relationship with oral infections and then possibly have other speakers follow along similar lines and thus give still further instruction, he would be rendering at least a small service. The object in selecting the three diseases included in the title of this paper was not on account of similarity in expressions of symptomatology, or due to any relationship of these diseases to each other, but because the essayist felt that we are called frequently into consultation in matters pertaining to them, and the pathology of which we as a class are not well acquainted with. A word more before going into a description of any of the particular diseases named and that for the benefit of those who may wish to follow in the practice of immunological and consultation work. Be sure of the need of strict observance of ethical procedure. The medical profession particularly is very keen on this matter and the strictest observance of all rules pertaining to ethics is a very necessary requirement in the pursuance of this line of work. When called upon for an opinion on dental matters by medical or dental practitioners, be sure that in all cases you strictly limit yourself to the mere opinion asked for and do not attempt to instruct the patient in any manner as to whom to go, or what the prospects of the case may be, or discuss with them any other matters not directly and closely associated with the mere diagnosis, and the facts connected with that particular phase of investigation. Needless to say, the diagnosis should be made completely and properly. Be sure that you are right and then do not hesitate to render your opinion in writing to the person who has referred the case to you. It is best that this written opinion be not given the patient but be sent directly to the consultant. To be able to do this work it is of importance to have rather a broad understanding of pathology in general; otherwise, the connecting link in your discussions with medical men will be found wanting and will not tend to elevate you in their opinion. The writer has found the medical profession very courteous to us as a body and very willing to come into closer association with us whenever they have found that our knowledge on these subjects has been the result of real study and investigation. What they have formerly most objected to was our lack of scientific training. This feeling is very rapidly disappearing; as so many men in our profession have developed no small amount of medical understanding. It would hardly seem necessary to state that in making these diagnoses final judgment often

will not be attainable, without further study of the case than simply a casual glance at some X-ray films. These pictures must be correctly interpreted; the opinion should never be based on a *single* picture, proper deductions must be made from questioning the patient as to symptomatology and history and sometimes further study of the blood and urine as well as occasionally examinations of the faeces, must be made and be properly interpreted. Many times these findings can be obtained from examinations previously made by the attending man and if reliance can be placed in his work then deductions may be drawn from *them* without re-examining the specimens yourself. Whenever it is found expedient, however, to utilize such laboratory examinations, it is best to do them personally, if that can be done without offense to the attending physician. The essayist has made a good many observations in various infectious conditions and it is surprising to him to find the variety of organisms commonly involved to be so few. Almost all of these infectious affairs show the predominating organism to be a streptococcus viridans, or occasionally the hemolyticus. Many times, of course, the infections are of a mixed character. It would not seem advisable in the short space of time allotted here to go deeply into a lecture on bacteriology, so let us confine ourselves for a few moments only to speak of these particular organisms, the streptococcus viridans, before attempting to discuss the different diseases in their relationship to mouth infections.

Speaking of streptococcus viridans as a bacterium is certainly open to criticism as many different forms of streptococci will, when grown on blood agar, produce the greenish discoloration which gives these streptococci the name of viridans. The name, therefore, by no means denotes any particular streptococcus but refers to a whole class of organisms. It has been found difficult to subdivide the different varieties along the lines of cultural differences, as many investigators have tried to do, but the one attempted by "Schottmueller in 1903 differentiating streptococci into two main groups, the one '*streptococcus longus seu erysipelatis*,' commonly known as hemolyticus, and including the most virulent varieties, having a tendency to form long chains and regularly producing hemolysis upon blood media; and the other, '*streptococcus metior seu viridans*,' including the less virulent strains, usually of shorter chain formation and producing green, non-hemolysing colonies on blood agar. It is now

universally accepted that these latter streptococci are the ones which usually predominate in milder forms of infections and chronic lesions." A number of other investigators since then have attempted to subdivide still further these viridans varieties according to their reactions to carbohydrate reagents. Not very much progress has, however, as yet been made in that direction. It would be most interesting to us if these students would ultimately be enabled to subdivide these organisms still further, *accurately*, and we would be able to determine the significance of their differences, as to virulency, invasive powers, etc., according to their reactions to various carbohydrates. Results of such definite classification would no doubt be of great value. The writer and some of his friends were recently interested in work of this kind, but found the cost of materials involved, at present, as well as the difficulty in obtaining them, so great that it has for the time being prevented them from further study along these lines. Andrews and Horder have suggested a subclassification of this sort, based on carbohydrate fermentation reactions, but it is not always reliable and is difficult to master. As was stated before, if we could determine the actual subclassified variety and become more familiar with its behavior—in other words, if we could be certain of what to expect from each individual variety, it would be a great help, but for the present most of this can only be surmised and at best we can only believe that certain phases of disturbance may follow the finding of certain types of streptococci. Streptococcus pyogenes or hemolytic strep. is a pus producing streptococcus (which in sugar reactions will ferment lactose, saccharose and salicin but not milk). It is found associated with severer types of systemic infections, such as are associated with suppurative lesions and it is quite likely that the streptococcus in oral conditions associated with severe systemic disturbances may belong to this type. Then again we find the streptococcus mitis, a short linked chain, which has all the cultural findings of the pyogenes, but is not nearly as infectious. Unfortunately, we cannot at the present time be certain with which of the two, the pyogenes or the mitis we are dealing, nor are we sure of the virulency of either. You can see readily what a large field for study lays open here, and what enormous benefit might be gained through its being properly worked out. Another type of streptococcus viridans frequently found in mouth infections is the salivarius. This also is a short chained variety, which in

carbohydrate reactions ferments lactose, saccharose and raffinose and coagulates milk. These are frequently found in the mouth, particularly in pyorrhea cases, but are not considered pathogenic. There are many other forms that might be mentioned here, but it is probably inadvisable at this time to go into a further discussion of this phase of the subject as it would lead into an investigation consuming hours. Enough is said if we will but realize that there are many varieties of streptococcus viridans, that their differentiation at present is more or less uncertain, and their effects when present in the human organism are still in doubt.

As to *general sepsis*; the etiologic factors are streptococcus and staphylococcus infections, but occasionally those of a mixed character will be found. A general sepsis occurs when these organisms find entrance into the circulation. In such cases where the floating of these bacteria or their toxins in the blood stream produce abscesses, the disease is termed pyemia. The introduction of such organisms into the blood stream originates from an infected area. The original seat of which may be purely local, such as skin wounds, the female generative organs after abortion or parturition, infections about tooth roots, abscesses of internal organs of any kind, seminal and vesicular infections. Speaking in exact terms we can hardly say that tooth extraction may be the cause of general sepsis, inasmuch as such a procedure hardly, if ever, would result in a primary seat of infection by itself—that is, from the operation itself. In those cases where general sepsis follows tooth extraction it is far more likely that it is due to the fact that the original infection, on account of which the tooth was extracted, is continuing to do its deadly work even after the tooth had been removed and that condition constitutes the real or primary cause of the sepsis. A general sepsis can, of course, be produced by filth conditions about a tooth extraction wound, brought about by carelessness of the patients themselves. You have all surely noticed many times how apt patients are to stick their uncleansed finger or soiled handkerchief into the wound, probably to feel if all has been removed, and by doing so they may infect themselves. The laity has also been known to produce general sepsis by their efforts to open abscesses with unclean needles and the like, or by opening abscesses without producing sufficiently free drainage. This latter condition may re-

sult from insufficient or unintelligent dental or medical procedure as well. An alveolar abscess which has spontaneously opened may result in general sepsis, due to lack of sufficiently free drainage; fortunately such cases are rare, although some are mentioned in the literature and they unfortunately resulted fatally. There are known many cases of general sepsis in which the true and original cause remains unknown and this variety of general sepsis is termed idiopathic or cryptogenic sepsis. Fortunately, present-day methods of diagnosis have been improved to such an extent that these cases are more rarely encountered and surely would be still less frequently seen if general practitioners were more awake to the fact that many such infectious processes may have had their origin in or about tooth structures and would for that reason call into consultation more frequently the assistance of dentists when their diagnoses alone would otherwise seem incomplete.

Thus, Loxor explains that cryptogenic sepsis may be produced by the inflammatory processes in the mucous membrane or small mouth wounds or alveolar abscesses, although these may seem to be healed but notwithstanding their outward appearance harbor groups of infectious organisms in the thrombosed vessels in the surrounding inflammatory area or in the adjacent lymph vessels from where they might readily enter the blood stream.

It is sad to relate that in medical literature even today very little importance is made of the fact that oral infections may be found to be etiologic factors in general sepsis. Infections from pus accumulations about diseased tooth roots which are imbedded in the spongy part of the maxilla may easily gain access to the blood stream. The writer feels quite certain that if in autopsies on patients who have died of cryptogenic sepsis, proper and diligent oral search was made for latent oral infections, such as abscess or pus retained in cases of pyorrhea or in cases of pulpitis, many of these instances would be found to fall into the category of general sepsis, and would not be classified as cryptogenic infections at all. Landgraf lays particular stress in this regard on the frequent presence of tooth granuloma and complains of the frequency with which it is overlooked. Frequently these granuloma may appear as benign at the time to the examining dentist, but their activities may suddenly be so influenced as to render them dangerous sources of infection. As a rule, however, the possibility or probability of such causes is entirely overlooked as patients do not complain of dental disturbances owing to the fact that the conditions do not always produce sufficient

local discomfort to draw attention to them. Herrenknecht cured a case of what was at first termed cryptogenic sepsis by the extraction of a tooth. Richardson also reports a case of such sepsis which finally was found to be due to three teeth, the roots of which were found to be bathed in pus, and the removal of these teeth with proper curettment of adjoining bony structures saved the patient's life. The pus retained in the alveolus of cases of pyorrhea which remains in untreated or improperly treated cases may well be the etiologic factor of a general sepsis, particularly if the pus extends to the root ends,—in other words, is deep-seated, in the cancellous part of the bony structures. This also is frequently lost sight of in making a diagnosis. Thus septic endocarditis has been found to be due to just such dental conditions in a number of instances. (Hartzell, Griffith, Paessler, Vannel.) The length of the incubation period of general sepsis varies from twenty-four hours to several days.

The symptomatology of general sepsis begins with a severe chill and fever, general malaise and fatigue. A repetition of a chill expresses the result of a new sudden invasion of infectious bacteria into the blood stream and in such exacerbations a quick rise in temperature rapidly follows the chill. Should the case end fatally a sudden drop in temperature and collapse usually precedes death.

As to diagnosis: This may at times be of a difficult differential character. Influenza, typhus, malaria, miliary tuberculosis, joint rheumatism, etc., offer many similar symptoms, but for general sepsis the joint pains, skin emboli, ocular disturbances, ulcerative endocarditis, hemorrhagic nephritis and enlargement of the spleen together with temperature changes are all relatively important symptoms pointing to general sepsis. A positive diagnosis cannot be made, however, without a blood examination along cultural lines showing the presence of staphylococci or streptococci or both. If such test is made a tuberculin complement fixation test should be made at the same time in order to positively exclude tuberculosis.

As we have seen, a number of tooth or mouth diseases may be etiologic features which the physician is unable to determine; therefore, the consultation of physician and dentist should not be delayed or neglected. Even in cases of general sepsis where the source of the infection is supposed to have been determined it should not be lost sight of that mouth infections may be concomitant etiologic factors and must of necessity be removed before a complete cure should be expected. The need of the joint work of the physician and dentist is here emphasized more than in almost any other disease owing to the severity of the affection. The prognosis is always serious. Recovery only occurs in those cases where timely differential diagnosis of the case is made and where proper remedial measures have been taken to completely eradicate the original source of infection, and even then we cannot be certain the invasion of infection into the blood stream has not been too severe to be overcome. After removal of the cause of infection sometimes the temperature will return to normal for a few days only to rise again with all the other symptoms recurring after lying in abeyance for a short time, so a return of the temperature to normal is not a sure sign of recovery. Com-

plete recovery has not occurred until all symptoms have remained absent for at least two or three weeks.

As to the interrelationship of tuberculosis and diseased tooth conditions, it seems almost useless to endeavor to include a chapter of this nature in a paper of this kind, as this field by itself could hardly be covered in a single lecture and much that might be of interest will naturally have to be omitted on account of lack of time. So many writers have expressed their views with reference to dental infections as etiologic factors in tuberculosis that it renders this field worthy of considerable study, particularly in those cases where tuberculosis has occurred in childhood or before the age of puberty. The cause of tuberculosis is the bacillus tuberculosis, discovered by Robert Koch in 1882. The tubercle bacillus is a small rod-shaped bacillus and of its morphologic characteristics, the most important is its characteristic of being acid-fast. It produces giant cells in any organ that has become infected with it. There is quite a lot of literature to which your attention should be called, dealing with oral infections as etiologic factors for tuberculosis. Some of the writers, it must be admitted, are presuming to draw unsubstantiated conclusions; thus Westenhofer claims that tubercular infection occurs in the irritation wounds of tooth extraction. Ziliz and also Michel believe that the long-continued irritated opened wounds of slowly erupting teeth (such as third molars) produce excellent seats for the invasion of tubercular organisms. However, other theories advanced are likely to be more correct and a good deal of importance is being placed on open carious teeth, particularly where putrescent pulps and alveolar abscesses occur in neglected mouths, this more particularly in infirm children. Oedenthal, Hoppe and Berten all have in numerous cases proven the interrelationship of carious teeth with enlargement of the tonsils and submaxillary glands, and while it is not a necessary consequence that such enlargements or swelling definitely denote tubercular infection it nevertheless is a fact that in many tubercular cases the organisms were found to be present in such glands.

Gravitz calls attention to just such a case where a lower molar had caused glandular enlargement and in which tuberculosis developed in the glandular structure and the bacilli were later recovered from the extirpated gland.

Cozzolino is another writer who claims to have found that the ulcerating and inflamed areas about slowly erupting third molars are a favorable seat for tubercular infection and from there would spread to the tonsil and into the lymph channels. You will realize that frequently these glandular enlarge-

ments are simply pictures of scrofular development, but in numerous cases actual tubercle bacilli and giant cell formation were found in such extirpated glands and tonsils. We could go on here *ad infinitum* citing authorities for these statements, but it can be definitely stated that oral infections, including carious teeth, are very frequently etiologic factors in tuberculosis. Numerous cases are on record in which tubercles were found in the pulps of teeth which were extracted and in these cases were associated enlarged glands and general tuberculosis. Carious spiculae of partly removed temporary teeth also render the surrounding tissue a favorable seat for easy invasion of tubercular organisms. Extractions in cases of suspected tuberculosis or in under-developed children should be done most carefully and the wounds afterwards treated surgically in order to prevent tubercular infection. Fortunately for many of these poor individuals nature has frequently barred the road for infection by the inhibitory action of the saliva and the presence of great numbers of saprophytes. The writer was recently asked why in a certain case of a rickety child where tubercle bacillus was found in the pulp chamber of an extracted temporary tooth the case did not develop into tuberculosis. Such a condition can readily happen. The acid-fast tubercle bacilli in their development in a pulp chamber do not find proper nutritional surroundings and develop into what are termed "granuloma of Munsch." These granuloma die or become latent owing to the fact that they do not become acid-fast and without this acid-fast qualification they do not multiply. Their inability to acquire this acid-fast qualification probably is due to the fact that the presence of lactic acid produced by the breaking down of the albuminous material in the pulp, hinder their development in that direction. Of great importance, however, is the fact that while such latent, non-acid-fast tubercle bacilli may for a time lie dormant in such pulps, the organisms would in case they should travel through the apex of the tooth receive all the proper nutritional matter they would require to develop them into acid-fast virulent tubercle bacilli and produce tuberculosis. In cases predisposed to tuberculosis it is of great importance, therefore, to see to it that the teeth and mouth are kept in good order, not only on account of the liability of producing a secondary infection but because of the fact that poor teeth mean poor nutrition and alimentary disturbances which will produce still further development of unhygienic conditions and lower the grade of vitality, thereby further favoring the development of tuberculosis.

In a former article the essayist went into great detail as to the relationship of dental symptoms to diabetes; but here he will only be able to hit the high spots. The two greatest investigators in the pathology of diabetes probably were Mehring and Minkowsky. They have clearly demonstrated by animal experimentation that the cessation of the internal secretion of the pancreas is the cause of lack of ability to digest carbohydrates. In the human subject diabetes consists in a lessened ability, or the total absence of ability to digest carbohydrates. How this disturbance in the balance of internal secretions is brought about is not yet made clear, but it would seem that the decrease of pancreatic secretion compared to its normal share is at fault. The symptoms in gross are loss of weight, good appetite, even extremely great appetite, oliguria, feeling of great weakness with impotency, severe itching of the skin and in females a pruritis vulvae, general pains about various teeth. The bacterial

flora of the mouth, particularly in severe cases is found to contain many sporulating bacilli. It is quite likely that this change is due to the digestive disturbances. These sporulating organisms grow, of course, more abundantly in the acid saliva of patients and are probably the cause of frequent stomatitis. One of the particular symptoms in diabetics is their lack of resistance to all forms of infections. This may either be due to the changes produced in the tissues by hyperglykemia or by the change in proportion of the internal secretions which are supposed to control the antibody production. Another striking feature in many cases is the complaint of these people of dry, hot mouths; due to the fact that so much sugar is thrown out by the kidneys that it takes a great deal of liquid to assist in carrying it off and, therefore, craving for liquids and feeling of dryness and heat in the mouth is but a natural sequence. Other oral disturbances are noted which may give a hint to possible diabetes; namely, the general reddening of the mucous membrane and the presence of stomatitis. The change in balance of internal secretions creates areas in the body which are apt to suffer from the slightest bruise; this will also have its effect in the mouth and we therefore frequently find that diabetics cannot wear their artificial substitutes on account of pressure pain, which no amount of adjusting of the appliance seems to remedy. When, therefore, patients present themselves who for a long time have worn artificial substitutes in comfort and suddenly relief ceases, although the mechanical piece seems to be in good fitting order, your attention should be drawn to a possible case of diabetes. Other diagnostic signs for the dentist lie in the appearance of the tongue which hardly ever will be found normal. It is enlarged and at its borders shows the imprints of the lingual surfaces of all of the teeth. Occasionally in addition to this it is found thickly coated and may be traversed with deep, painful fissures which heal with great difficulty. The papillae of the tongue are usually enlarged and discolored in patches. They are slightly glistening blue-red and resemble to a degree a leukoplakia and occur on the tongue as well as on the cheek. In advanced cases the gum tissue becomes detached from the underlying alveolar border and becomes necrotic, or it retracts sufficiently far to expose large non-sensitive root surfaces. Small blisters on the mucous membrane are occasionally seen which if they burst leave painful, little burning ulcers. These may develop so as to

lend to the picture the appearance of scorbutis. That periodontal symptoms should manifest themselves would follow as a natural conclusion owing to the close interrelationship of the gum tissue with the underlying periodontal membrane. Alveolar blenorrrhea frequently present is difficult to differentiate from a true pyorrhea. Pyorrhea, as you know, affects single or small groups of teeth, more often in the lower jaw, but this alveolar blenorrrhea takes in whole rows of teeth, beginning usually at the last molar and spreading forward, and attacks usually those in the upper jaw first. The amount of discharge from these surfaces varies with the increase or decrease of the sugar found in the urine; in other words with the rise and fall of the severity of the attacks of the disease. In the beginning such a blenorrrhea may disappear entirely under proper dietary measures. Large amounts of soft, light yellow tartar deposits may be found and if removed are very rapidly replaced by new additions. As metabolic disturbances are frequently the predisposing factor in the etiology of pyorrhea, therefore, it goes without saying that true pyorrhea would naturally accompany other symptoms of diabetes frequently. It is, after all, of small importance whether we wish to accept this term of blenorrrhea or not, or call it pyorrhea, but as the symptoms differ somewhat from pyorrhea it is well to recognize them and suspect cases of diabetes. It is not to be said that pyorrhea or blenorrrhea always occurs but if pyorrhea cases present themselves with *painful* teeth which pain does not respond to treatment or even extraction, it will be well to examine the urine for sugar, particularly if the onset of pain was acute. This diabetic blenorrrhea is accompanied with gradual loosening of teeth, but whether lost from natural consequence or by being extracted the pain does not diminish. This loosening and exfoliation of teeth, however, may be entirely missing in the symptomatology, but when it does occur it should draw your attention to possible systemic disease, particularly if the teeth show no sign of trouble in themselves. A peculiar thing about these loosened teeth is that they immediately tighten up under proper dietetic treatment. They therefore should never be extracted in diabetic cases. The pulps of such teeth are usually found vital and the destruction of them artificially does not minimize the pain any more than the extraction of the tooth. In pyorrhea cases, when teeth are extracted, the pain stops almost immediately and the sockets heal kindly, but

in these diabetic cases we are very apt to find following extractions quickly ulcerating conditions attacking the hard tissues and resulting in necrosis.

Magitot claims that the teeth of diabetics decay very rapidly, beginning usually on the molars and spreading forward; thus sudden attacks of new caries of the teeth should lead to making urinary analysis, particularly when it occurs in the mouth of patients who are habitually comparatively free of caries. The ring form of caries described by Grunert is very noteworthy and he justly claims to have noted that this form of caries attacks the buccal surfaces of the molars and premolars, the gingiva retracts and occasionally the labial surfaces of the anterior teeth are attacked similarly. This in contradistinction to pyorrhea cases where the necks of teeth become exposed through the retraction of the gum which seldom is followed up by caries. Such attacks begin with a yellow discoloration and a narrow slight, *painless* depression, quite different from such conditions in normal health at the neck of a tooth. It looks as if cut with a saw, grows toward the crown of the tooth, attacking mainly the dentin, so that in a short time the whole tooth is hollowed out. The same author asserts that cement fillings rapidly disintegrate in these mouths, but the writer fails to see why they should, notwithstanding the fact that he fully realizes the strong acid reaction of the saliva. This acid condition of the saliva is ascribed by Magitot, Port and others to the fact that sugar destruction is going on, producing lactic acid. Scheff and others do not coincide with his views, but they admit nevertheless the acid condition. Mantner's theory that this acid condition of the saliva is due to acetone seems more rational.

The saliva frequently is found to be decidedly acid even when the urine shows no acetone whatever; that may well be so, but do not let us overlook the fact that a good deal of acetone is thrown out by exhalation and it is possible that may have something to do with the production of acid saliva. We shall say very little of the prognosis and treatment of diabetes as we cannot go into too much detail. Be it sufficient that diabetes in childhood is usually fatal; carbuncles, furunculosis and other pus conditions, together with gangrene and coma are very bad symptoms and so is also the characteristic mouth odor of fresh fruit, due to acetone. A thorough understanding of the interrelationship of all these diseases with dental and oral manifestations together with study and research to master the meaning of oral symptomatology and the proper interpretation of symptoms and X-ray pictures is recommended.

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Etc., etc.

DENTAL CONDITIONS IN THE ARMY BEFORE AND DURING THE PRESENT WAR.*

BY LT. COL. H. O. SCOTT, D. C., U. S. A.

Mr. President, Members of the Illinois State Dental Society and Guests:

My invitation to read a paper on the dental conditions in the Army before and during the present war, at Col. Logan's sugges-

*Read before the Illinois State Dental Society, May, 1918.

tion must have been due to my having had some thirteen years service and not to my past performances as a writer or speaker. Therefore it is with some trepidation that I come before you today, this being my first appearance in public. I am sure that you will lend me the moral support necessary when I tell you that Dr. Davis' invitation to appear here caused more fear and trembling than will be occasioned when I get orders for the front.

The subject, "Dental Conditions in the Army Before and During the Present War" I will take up from the time of the Philippine Insurrection; at the start of which there were no Dental Surgeons in the Army.

Legislation. The first dentists to actually perform dental operations in the Army, I believe, were Drs. Ware of San Francisco and Craig of Kansas City. These men had enlisted, and at the request of their commanding officers equipments were furnished by the Surgeon General of the Army. Dr. Ware was stationed at the convalescent hospital, Corregidor Island, and Dr. Craig in northern Luzon. In the early part of 1901, through the efforts of such men as Marshall, Donnelly and Bryant, thirty Contract Dental Surgeons were authorized in the Army. Three of them, Drs. Marshall, Oliver and Hess, being designated Supervising Dental Surgeons. The contracts were for three years, or to be annulled as the Surgeon General saw fit. All Dental Surgeons were entitled to the respect and courtesies of an officer, quarters when available and the privilege of purchasing from the commissary. The Supervising Dental Surgeons received \$210.00 per month, the others \$150.00. The thirty Contract Dental Surgeons authorized in 1901 was increased to thirty-one by special Act of Congress and this number continued to take care of the entire army, including the Philippine Scouts, and Porto Rico Infantry until 1911, when Congress passed a law giving Contract Dental Surgeons then in the service the rank of "1st Lieutenant Dental Surgeon" with all the privileges of 1st Lieutenant in the Medical Corps, including the right to retirement. This law also created Acting Dental Surgeons who were to be promoted to 1st Lieutenant after three years service, if services had been satisfactory, and they passed a satisfactory examination. The number of Dental Surgeons and Acting Dental Surgeons authorized was increased to sixty.

June 3, 1916, a law was passed promoting all Dental Surgeons with over eight years service to Captain, abolishing the grade of

Acting Dental Surgeons and promoting all those then in the service upon examination to 1st Lieutenant Dental Corps, and authorizing not to exceed fifteen Majors after twenty-four years' service. It might be of interest to you to know that at this same time a law was passed commissioning Veterinarians, and making them Majors after *twenty* years service. At this time our corps was authorized to contain one Dental Surgeon for each 1,000 of the strength of the line, or fighting branches of the Army. Of course, the non-combatants of the army would have the toothache and have to be treated as well. Constant changes in the personnel in the army, men being discharged, new recruits coming in, will give you an idea of the amount of service to be rendered. Also you must remember these troops were in many different posts of the United States, Alaska, Porto Rico, Hawaii, Philippines and Panama, and that we had to distribute our time accordingly. As an illustration, at one time while stationed in the Department of the East, I received an order on Christmas day with a six month's itinerary. I was to report at a certain post on January 1st and during the six months following, make some twelve or thirteen different posts with my longest stay at any one, twenty-four days. At the end of the six months I was to report by wire from the last of these stations for further orders, which I was informed meant another three months' trip, and not a return to my home station. Quite a life for a married man. But that kind of service is over. The policy of the War Department now is to have fewer and larger posts.

On October 6, 1917, Congress passed a law giving the Dental Corps equal recognition with the Medical Corps; one Dental Officer to seven Medical Officers, and the like proportion in each grade up to and including Colonel. This means one Dental Officer for each 1,000 of the total strength of the Army. So much for the different steps in promotion and increase since the first organization in 1901.

Equipment. The Field Equipment consisted of foot engine in chest, two instrument chests, containing a fair assortment of instruments and supplies, a field desk with professional books, stationery, blank forms, etc., a portable dental chair in chest, two folding tables and chairs.

The base outfits consisting of electric equipment, hydraulic chairs, etc., were later installed at the larger hospitals, Walter Reed in Washington, Letterman in San Francisco, Division in Manila,

the recruit Depots, Ft. Slocum, Columbus Barracks, Jefferson Barracks, Ft. Logan, Ft. McDowell and from time to time since, at others of the larger posts as thought necessary by the Surgeon General of the Army.

The plan of equipment at the present time for the cantonments is to have two or more unit buildings with base equipment, for from ten to fifteen Dental Surgeons in each unit, at each camp and in addition to have portable equipments in storage ready for field service when a Division is ordered overseas.

Professional Services. Dentistry in the Army has advanced and kept pace with the times as well, or even better than could be expected where men are isolated as we are when on foreign service, and also at some of the army posts in the United States. Few of you, I imagine, appreciate what a treat it is for an Army Dental Surgeon to be able to attend a State or National Dental Society meeting and pick up the new ideas and mingle with other dentists.

Our personnel has improved as our advancement has gone forward. The men who had no pride in the Dental Corps, and were in the Army solely for what they could make out of it have been eliminated. Here I wish to state, however, that we have also lost some excellent dentists who became weary of the long wait for recognition and advancement to which they were entitled, and resigned.

On account of the small number of Dental Surgeons in the Army for years our work naturally has required that every man must be a general practitioner, and not a specialist. All classes of work were authorized and all materials furnished by the Government for work on officers and enlisted men, except gold, until 1909, when, due to arguments with enlisted men over payment for gold work, some refusing to pay authorized charges and other cases where some of the men I previously mentioned attempted to overcharge the enlisted men, regulations were issued which forbade the Dental Surgeon to enter into any financial agreement with an enlisted man involving an obligation to pay for materials used in dental work. Only those materials furnished by the Government to be used. This order was modified for men serving outside the continental limits of the United States, they being authorized to make deposits with their commanding officer to cover cost of material. Otherwise they would have no way of obtaining gold work when

indicated, there being no civilian dentists available. Our work therefore has been mainly treatments, extractions, filling with cement and amalgam and plate work.

In the surgical line we have more fractures of the mandible, antrum cases, cases of necrosis, fractures of the teeth and alveolus, and impacted third molars, than the average civilian dentist. In work of this kind it has been my experience that the Medical Officers were always glad to have us handle these cases when Dental Surgeons were available. A case in my experience presents itself here which I have often had in mind. While serving in the Philippines, a man in the artillery was brought to my office with a double fracture of the mandible, on one side vertically between the cuspid and first bicuspid and on the other side through the ramus just back of the angle. He had fallen off the gun carriage at drill and raised up just in time to be struck by the pole of the caisson as it passed over him. Having had him as a patient a short time before and remembering that he had a good occlusion I wired his jaws together using the upper arch as a splint. His battery was due to sail for the United States in ten days, and fearing that he would be transferred to another regiment if not allowed to accompany them, he came to me and begged to be allowed to go. This was arranged, a letter to the surgeon on the transport describing his case, and as he said that he always became seasick, a pair of wire cutters were given him after telling him how to cut the wires in an emergency. Fortunately they were not needed.

Conditions Since the Declaration of War. As no doubt many of you know, a law was passed authorizing a Reserve Officers' Corps in the different Staff Departments, Dental, Medical, Signal, Engineers and Quartermaster. This has increased our strength, including the Regular Army Dental Corps with the Dental Reserve Corps and the National Guard up to something like 1,800 dentists on active duty at the present time. Practically 100 of these are at the Medical Officers' Training Camp at Camp Greenleaf, Ft. Oglethorpe, Ga., under two months' training, one month military and one month professional training. The remainder are attempting to put the mouths of the men, who have been called by the draft or volunteered, in the best possible condition before they leave for the trenches. Some will no doubt by this time be repairing jaws on the other side.

Our work on this side is not only to fill cavities in teeth, extract

roots which are beyond repair, and replace with artificial dentures, but we are attempting to eradicate conditions which might be the causes of focal infection when the men get into the trenches, by removing irritating deposits, discovering with the X-ray hidden necrotic bone, blind abscesses, poorly filled root canals and remedying these conditions by curetting and root-resections.

In closing I want to mention the most important change that has come about in our corps due to the war, and which we have long felt the need of. That is representation in the Surgeon General's Office and also a Dental Surgeon in charge of the purchase of dental supplies. The Army Dental Surgeon has never been better equipped than at the present time, and the co-operation between Medical and Dental Officers indicates union of purpose—TO WIN THIS WAR.

I thank you.

WHITHER ARE WE STRAYING OR WHAT NEXT?*

BY DR. J. K. CONROY, BELLEVILLE, ILL.

Believing that the teeth of the human kingdom are of vital importance and one of the most valuable assets to the health of the individual, the mirror through which the orthodontist sees the character of the child develop, the pride of the parents, who are interested in the future health of the child and his physical development, and because we all go through life with that part of our bodies always exposed to the public until we are laid to rest at the claim of the Grim Reaper, may I ask the question given in the title of this paper?

It would seem that ideas are constantly developing in all crafts, and dentistry is no exception to the rule. Some last for a time, and others die very quickly. It is needless to enumerate many, suffice it to mention a few.

Many of the older practitioners remember the amalgam war, the advent of cataphoresis, the casting of the inlay which was to sound the death knell of the foil filling, the discovery of emetin, which was to be the solution of the great perplexing problem of so-

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called pyorrhea. The good have found their permanent places in dentistry, and the wicked laid on the back shelves as reminders of the hard earned dollars spent in taking the word of others to help in the problems we are still unable to solve.

It would seem to your essayist that we as a profession, are entirely too anxious to arrive at conclusions, and accept responsibilities before we have the evidence or proof, and most, I dare say, nearly all our present evidence is not even circumstantial, and here I come to the real intent of this paper, partly in criticism, but mainly in question.

What must we do to save teeth in which the pulps are to be removed, be they infected or not? Is it possible that thousands of us, having spent the best years of our lives trying to give faithful service to our patients, and knowing we have attained results, must now accept the ruling that in the future the great majority of these cases will have to be treated with the forceps instead of the root canal filling, for fear that our work may not reach the highest possible perfection, and may be the cause of a heart lesion which will cause the death of the individual? What impression is this teaching going to have on the general public, and are there no other ailments to which humanity is liable that might cause the same condition? What is to become of fully ninety per cent of the human race who are not in a position to receive such services? Let us study the facts—let us have the evidence.

I regret very much that I am not at present in a position to present radiographs of cases I have in mind, but speak from a practice of eighteen years in one community, and I see many of my patients alive and apparently enjoying good health, the roots of whose teeth were filled as well as I know how, and a number of these people are having the teeth of their children cared for in the same manner. I presume when these people become afflicted with the various ills which are supposed to be caused by improperly filled root canals, and the family physician has reached the limit of his knowledge, they will be referred to the dentist, accompanied by radiographs, taken by the physician or some dealer in x-ray machines, with orders to extract certain teeth, but up to date, I am not aware of having been the cause of the death of any individual in this manner.

The extremes to which these ideas may be carried are very well illustrated by men who are looked upon as high authority in the pro-

fession, and are sufficient to strike terror in the minds of the young practitioner. I want to apologize, at this time, for using a number of quotations, but I feel there is such a variance of opinions that it is at least worth the effort, for, as I have said, let us have the evidence.

In this connection, I wish to quote part of an article by Josef Novitsky, M.D., copied from the *American Journal of Surgery*, August and September, 1917, appearing in the December, 1917, issue of the *Dental Cosmos*, regarding the removal of infected teeth, viz:

"The gums are incised and a liberal flap of mucous membrane and periosteum is stripped off the alveolar process, exposing the entire length of the outer plate covering the roots of the affected tooth. The outer plate of bone is removed, exposing the tooth roots, in order to use them as a guide to pathological conditions at their apices. My operative procedure offers the maximum opportunity for ventilation and drainage, direct access to, and complete removal of tooth and disorganized jawbone. * * * Dead teeth, when in a pathological state, should not be extracted, but should be thoroughly dissected out."

In the February, 1917, issue of the *Dental Cosmos*, Dr. Elmer Best of Minneapolis tells us that unless we do this class of work in a more thorough manner, the medical profession will soon be telling us when we shall and shall not handle pulpless teeth. In answer to this, I shall quote from the *Journal of the American Medical Association*, issue of November 4, 1916, page 1373, the following editorial in part, viz:

"It is clearly the duty of the physician to secure the consent of the patient or of the patient's guardian in case the patient himself is not capable of granting consent before performing any mutilating operation. The medical profession is certainly not called on, in any sense, to support the physician who transgresses the elementary principles of ethics."

Another instance has come to my notice. Dr. Thomson of Minneapolis limits his practice to the treatment of the teeth of children under twelve years of age and makes the assertion that he does not attempt to treat any tooth where the pulp is involved, but in all such cases, he resorts to extraction. Can it be possible this is in line with the teaching of modern dentistry, and is it possible that all the work

of our research institutes on this question, has been carried on in vain?

In the September, 1917, issue of the *Dental Cosmos*, an article is published, written by Dr. Percy R. Howe of the Research Laboratory of the Forsyth Dental Infirmary, giving a detailed account of the action of Nitrate of silver and Formaldehyd solution in the treatment of root canals, in which he states:

"It is effective in the sterilization of the disintegrated dentin, etc. 2. It is possible to completely sterilize a putrescent pulp without removing it, etc. 3. It is effective in allaying the pain in acute pericementitis following the death of the pulp, etc. 4. It is effective in the treatment of chronic abscesses and in fact these cases are largely the result of the development of this treatment, etc. 5. We believe this to be a most admirable means of taking care of the apical foramina, if properly used, etc., and finally, he says, it permeates any affected dentin, and fills it with metallic silver in a wonderfully perfect manner."

I most earnestly recommend that every member of this society read and study this article.

I am more than ever convinced that a large majority of systemic diseases, which are attributed to improperly treated teeth, are the result of focal infections, due to lack of proper knowledge of the lymphatics in the throat, nose and the accessory sinuses, and as these conditions are only the occasional cause of trouble, lasting for a few days, and occurring possibly, three or four times in a year, the parent is inclined to feel that the child will outgrow the trouble, and as a matter of fact, these attacks of tonsilitis frequently become less frequent, but the crypts in the tonsils remain, and are a continual source of infection which enters the blood stream in practically the same manner as do infections from abscessed areas in the region of the apices of the roots of teeth. The wholesale removal of the tonsils would seem to me to be just as important as the wholesale extraction of the teeth, if we should only bear in mind that a perfectly sound and healthy appearing tonsil is often the seat of a concealed infection, but the removal of a tooth or several teeth is often the easiest way, as our x-ray will tell us there is an infection at the apex of the root of the tooth, but unfortunately omits to show any trouble existing such as an infected tonsil, and at this point it

would be well to give a brief description of the blood supply to the teeth and tonsils to understand their intimate relationship.

Authority—Piersol's Anatomy.

In the consideration of the anatomical relation of the parts in question, the circulatory system is of the greatest importance, hence it will be given consideration here. The arterial tracts do not contribute very greatly to the dissemination of infectious materials and toxic substances throughout the body. The venous and lymphatic systems are of greater importance since they drain the areas. Consequently, a detailed study of these, proves very interesting.

It would be only reasonable to conclude that an area possessing rich blood supply and drainage would be more dangerous if in an infected state than an area not as well supplied. The blood supply to the periapical tissues is undoubtedly very good. The tissues are well supplied. But the tonsils, adenoids and accessory nasal sinuses are far better taken care of in this respect.

We will consider, for a moment, the tonsil. It has a rich blood supply. It is drained by the tonsillar plexus, and this tonsillar plexus branches to several important veins. The pharyngeal veins empty into the internal jugular. These pharyngeal veins take their origin from the plexus pharyngeus which covers the outer surface of the pharynx, lying between the constrictor muscles and the pharyngeal portion of the buccó-pharyngeal fascia. In addition to branches from the pharyngeal wall, this plexus receives branches from the anterior recti and longus colli muscles, and from the soft palate, the tonsillar plexus and the eustachian tube.

The facial vein is a large and important vessel, receiving several branches, among which are the deep facial and the inferior or descending palatine vein.

The deep facial originates in the pterygoid plexus, through which it receives branches from the mucous membrane of the maxillary sinus.

The descending palatine vein originates in the tonsillar plexus.

Both of these veins drain into the facial vein, and it, with all those mentioned so far, drain into the internal jugular, and all receive branches from the tonsil.

The veins coming from the teeth empty for the most part into the pterygoid plexus which does not offer an easy path to the brain.

The accessory sinuses of the nose drain posteriorly and for the

most part directly, into the sinuses of the dura mater. Notable of this group, is the superior ophthalmic vein which drains by its tributaries the ethmoid and sphenoid sinuses, and the superior turbinate bones. This vein empties directly into the cavernous sinus, thus offering an easy mode of entry for infection at this vulnerable point.

It would seem as if it were folly to read dental journals and try to save people from losing their teeth simply because they were either foolish or unfortunate enough to permit decay to advance far enough to involve the pulps if we must follow the advice of Dr. A. C. Fones in the April, 1918, number of *Items of Interest*, that the loss of the tooth is the price one must pay for allowing the decay to involve the pulp.

I have no desire, and I question my right, to even raise an objection to the opinions of such men, but I do contend that when I cast my lot with the dental profession, I feel it my duty to care for the teeth in such a manner as to make them useful in future years, and I want to say here, that when I must extract all diseased teeth and stop the use of one of the greatest remedies ever given to the dental profession, viz: formo-cresol, I want to stop the practice of dentistry, and seek another means of livelihood, or try to become an extraction specialist.

I am satisfied that the present chaotic condition is in a large measure due to the lack of interest shown in the proper care of practically the most important phase of our work. Root canal work is at best a very tedious and serious operation, requiring time, patience and energy, and as a result, much of it has been done in a rather careless manner, and in the opinion of your essayist, a complete lack of sterilization at the critical part of the operation, viz: the final work of filling the canal. It is at this point the damage is done.

If the preliminary work has been done at a previous sitting, the canals cleaned thoroughly, and an antiseptic dressing placed in the tooth to maintain this condition, and the tooth hermetically sealed, the final work should be done with perfectly clean hands, perfectly sterilized instruments, perfectly sterilized root canal points, a clean, properly adjusted rubber-dam, the tooth and adjacent area well cleaned with alcohol, no cotton on broaches, or cotton points to be used in the tooth. Then we have every reason to feel our work will at least be as near satisfactory as is possible, and unless we

are going to use the utmost care with our root canal work, I must then say that I agree with those who advocate extraction of infected teeth.

I do not wish it to be understood that I would question the fact that infected areas around the apices of the roots of teeth will frequently be the cause of a lesion in some other part of the body, but I do wish to emphasize that there are other structures which I dare say are ten times more liable to cause the same kind of an infection, and before we condemn the dental profession and advocate the ruthless extraction of infected teeth, it would be well to ask our brothers of the medical profession to devote more time to the care of the nose, throat and accessory sinuses.

RETENTION OF FULL DENTURES*

BY RUPERT E. HALL, D.D.S., CHICAGO, ILL.

Denture retention will be a subject and problem perplexing and perpetual until its troubles find their logical solution in understanding of its physics, adoption of a classification of jaws and standardization of the requirements and technical procedures incident to the fulfillment of the requirements in each respective class.

The success of an artificial denture can be no better than its supporting foundation—the jaw. Hence, the thoroughness with which we study and utilize the foundation will determine the success or failure of the restoration. Equal study and care, however, must be given the form and arrangement of the teeth, as the retention of the substitute may be impaired and the denture condemned as ill fitting and unsatisfactory, when the real trouble lies in faulty form and arrangement of the teeth. Thus do we find that the successful retention of artificial dentures is not wholly dependent upon good impressions, but upon the form and arrangement of the teeth as well.

To begin with, let us define some of the terms commonly used in denture nomenclature, which, it seems, are lacking in accuracy of definitions and understanding. Also, perhaps, let us add some new

*Read before the Illinois State Dental Society, May, 1918.

terms, and then when used in the treatise to follow, interpret them accordingly.

First: Let us define the word or term *jaw* in its application to artificial dentures.

Jaw may be defined as meaning all surface tissue of the jaw ridge, and in case of the upper, the hard palate, upon or about which the base of an artificial denture is adapted and indirectly supported or suspended, excepting the attached flexible peripheral tissues. These may be more specifically described as all tissues, the fixed or rest position of which are not modified by muscular action.

Second: *Flexible Peripheral Tissues.*

Flexible peripheral tissues may be defined as meaning all tissues attached to the jaws that are moved or are movable by the action of the muscles including the soft palate.

Third: *Base.*

Base may be defined as meaning that part of the surface of an artificial denture that is adapted to and covers the jaw.

Fourth: *Periphery.*

Periphery may be defined as meaning that part of the border surface of an artificial denture adjacent to or continuous with the base that is adapted to and covers the flexible peripheral tissues.

Fifth: *Intermediary or Interposed Liquid.*

Intermediary or interposed liquid may be defined as meaning that, normally, the fluid interposed between the base of an artificial denture and the jaw is saliva.

Sixth: *Contact.*

Contact as applied to artificial denture nomenclature, as for example, when we speak of the base being in contact with the tissues of the jaw or vice versa, is a misnomer. Such relation or condition is not possible, owing to the fact, that a liquid—the saliva—interposes between the base and the jaw. Consequently, the word or term contact, will not appear in this connection in this treatise. The word or term adaptation will be used in its stead, definition of which follows:

Seventh: *Adaptation.*

Adaptation may be defined as meaning degree of conformity and closeness of apposition of the outline and of the surface of the base and periphery of an artificial denture with that of the jaw and flexible peripheral tissues to establish such relation that will bring

their surfaces within the required distance or proximity with each other to make active the adhesive and cohesive forces of the interposed saliva between and throughout the complete surfaces of the jaw, flexible peripheral tissues, base and periphery of the denture.

Eighth: *Basal Seat.*

Basal seat may be defined as meaning the relation the base of the denture bears to that of the indirectly supporting or retaining jaw in the state of adaptation, meaning that the jaw does not support or retain the base directly, but indirectly through the medium of interposed adhering saliva, the actual seat of the denture being formed and made up then, by and of the film of the interposing saliva upon or about which, through its adhesive and cohesive forces, the structure is supported or retained.

Ninth: *Peripheral Valve Seal.*

Peripheral valve seal may be defined as meaning adaptation between the periphery of the denture and the flexible peripheral tissues preventing the ingress of air beneath the base of the denture in case of displacement and partial dislodgement.

Tenth: *Retention.*

Retention may be defined as meaning resistance of the restoration to displacement, partial and complete dislodgement.

Eleventh: *Displacement.*

Displacement may be defined as meaning any change in relation of the base with that of its basal seat.

Twelfth: *Partial Dislodgement.*

Partial dislodgement may be defined as meaning any movement of the structure beyond the occurrence of displacement.

Thirteenth: *Dislodgement.*

Dislodgement may be defined as meaning breaking of the seal of the peripheral valve.

Fourteenth: *Adhesion, Cohesion, Vacuum, Partial Vacuum and Atmospheric Pressure.*

Adhesion means the force exerted by the attraction of unlike molecules for one another, as that of the molecules of the interposed saliva between the surface of the base of the denture and that of the adapted tissues of the jaw for those of the substance of the structure of the base of the denture and the tissues of the jaw. The surface of the adapted base of the artificial denture adheres to its basal seat—supporting or retaining film of interposed saliva—by the

adhesive attraction of the molecules of the substance of its structure for those of the intermediary liquid—the saliva—and not by or through attraction for those of the indirectly supporting tissues of the jaw. Thus, we repeat, the word or term adhesion used in this connection, namely—the surface of the base of the denture adheres to that of the tissues of the jaw, and vice versa—is a misnomer.

Cohesion means the force exerted by the attraction of like molecules for one another.

Vacuum means confined space devoid of matter.

Partial vacuum means confined space with degree of emptiness.

Atmospheric pressure means the force exerted by the weight of the air which envelopes the earth, the weight of which at sea level, exerts a pressure of 14.7 lbs. to the square inch of all surface or surfaces exposed to its presence, as is manifested upon the exposed surfaces of an artificial denture to such extent and degree as the adapted jaw has surface and space or spaces between the surface of the adapted base and that of the jaw and the degree of vacuity of such space or spaces.

The physical forces retaining an artificial denture, following the establishment of adaptation and basal seat, are *adhesion* and *cohesion*.

Adhesion in this particular is the aggregate molecular attraction exerted by the molecules of the interposing liquid for those of the substance of the structure of the base of the denture and those of the adapted tissues, lying in planes disposed at right angles to tending displacing forces.

Cohesion is the aggregate cohesive attraction exerted by the molecules of the interposed liquid between planes disposed at right angles to tending displacing forces in value as the surface and conformity of the base covers and hugs the adapted tissues.

Atmospheric pressure, contrary to the opinion of many, is not a retaining force acting conjointly with adhesion and cohesion in the position of basal seat. The space between the base and the adapted jaw is completely filled with aerated saliva equalizing the pressure within the space with that of the atmosphere without the space. In further substantiation of this claim we quote from Gantos physics, the following:

“Adhesion.—The molecular attraction exerted between the *surfaces* of bodies in contact is called *adhesion*.

Adhesion takes place between solids. If two leaden bullets are cut with a penknife so as to form two equal and brightly polished surfaces, and the two faces are pressed and turned against each other, until they are in the closest contact, they adhere so strongly as to require a force of more than the weight of 100 grammes to separate them. The same experiment may be made with two discs of glass which are polished and made perfectly plane. When they are pressed one against the other, the adhesion is so powerful that they cannot be separated without breaking; hence the particles have been brought within the distance of molecular attraction. As the experiment succeeds in *vacua*, it cannot be due to atmospheric pressure, but must be attributed to a reciprocal action between the two surfaces."

A most excellent work on this particular question is that of Dr. Geo. H. Wilson, contained in his book, *Wilson's Dental Prosthetics*, and is earnestly commended for your careful reading and study.

Were the maximum pressure of the air utilizable by complete removal of the interposed aerated saliva and evacuation of the air thus formed, we could then have the maximum pressure of the air or 14.7 lbs. to the square inch of base surface covering the tissues of the jaw in planes disposed at right angles to tending displacing forces, both retaining, and resisting displacement of the denture. But, were the maximum pressure of the air utilizable through such source, the tissues of the human body will not tolerate permanently even a partial vacuum of any appreciable degree. We see this demonstrated in the air chamber commonly used in attempting to permanently aid retention of upper dentures by this means. Hypertrophy of the tissues occurs and the cavity fills. Thus do we show that atmospheric pressure cannot be utilized as a *constant* force to retain artificial dentures, owing to the fact that the interposed film of aerated equalized saliva between the base of the denture and the jaw cannot be dispensed with and nature will not tolerate the negative pressure of evacuation about her tissues to make manifest such pressure by means of vacuum. Therefore, it must be considered that we have no *degree of evacuation* existing between the base of the denture and the adapted tissues, consequently, no possible aid from atmospheric pressure retaining the denture in the position of basal seat, but that it is supported or retained in proximity with

the adapted tissues by the attraction of the molecules of the interposed liquid for those of the structure of the denture.

Now that we have shown that adhesive attraction of the molecules of the saliva for those of the substance of the structure of the base of the denture is the retaining force that holds the denture in proximity with the adapted tissues—we shall proceed to show that the strength of the adhesive forces exerted by the molecules of the interposing saliva in their attraction for the base and tissues respectively, is not the force actually determining that required to displace the structure, but that the force determining the power required to displace the denture is that of the cohesive forces exerted between the molecules of the interposed saliva for themselves.

The degree of viscosity of the saliva makes it a liquid the molecules of which, in this connection, have greater adhesive power than cohesive power.

A chain is no stronger than its weakest link. Let us assume the molecules of the interposing liquid—the saliva—to be links of a chain.

Since the adaptation of an artificial denture cannot be made so close as to reduce the interposing film of saliva to one layer of molecules, and since the adhesive forces of the molecules of the saliva are greater than those of the cohesive, this means that the interposed saliva in the space between the adapted tissues and the surface of the denture—the chain—has a weak link in its middle. Displacement then, occurs by breaking the weak link—the cohesion of the saliva.

Since the retaining forces offered for resistance to displacement and dislodgement of the denture by cohesion alone, in the absence of peripheral valve seal, are low in comparison with those required to resist the displacing and dislodging forces of efficient incision and mastication, displacement and dislodgement of the denture easily and readily occurs.

How then, may aid by utilization of the forces of atmospheric pressure be accomplished for resistance of an artificial denture to dislodgement for the efficient incision and mastication of food?

This aid may be indirectly accomplished by the formation of an emergency partial vacuum arising momentarily and simultaneously with displacement of the denture by the forces of incision and

mastication or by any other force causing displacement of the structure.

The theory of retention by the indirect aid of the forces of atmospheric pressure and the method of denture adaptation and construction for its accomplishment, about which this paper deals in part, insures the maximum amount of retaining force by the indirect application of the pressure of the atmosphere through the formation of a momentary partial vacuum arising and acting simultaneously with displacement and partial dislodgement of the denture.

The requirements of the construction are, that the base of the denture should cover and be adapted to the entire surface of the jaw. And have added to it a periphery with border surface continuous with that of the base of the denture. And that the surface of such border be extended upon and adapted to the flexible peripheral tissues so that there is created a seal and valve-like action between the flexible peripheral tissues and the surface of the periphery, to preclude, therewith, the ingress of air under the base of the denture and resist or prevent partial and complete dislodgement of the same through the indirectly applied resisting forces of the atmosphere should displacement occur.

Precluding the ingress of air between the surface of the base of the denture and the tissues of the jaw at the time of displacement sealing the space occurring between the base and jaw without admitting the air, forms thereby, simultaneously with displacement, a partial vacuum.

The TIDAL or momentary partial vacuum created between the base of the denture and the adapted tissues of the jaw is therefore manifested only when the resistive forces of the cohesion of the molecules of the interposed saliva are overcome and displacement of the denture occurs. Since the resultant atmospheric pressure is the direct force holding the denture against partial and complete dislodgement when forces displace the structure, forming a relative partial vacuum, it is obvious that any force that creates the space, degree of vacuity and resultant atmospheric pressure, increases automatically, thereby, resistance of the denture to further partial or complete dislodgement. The degree of vacuity of the space is in direct ratio to the volume of the vacuum, owing to the fact that the sealed periphery precludes the ingress of air and the increasing

space between the base and the jaw still accommodates the same quantity of air. Boyle's Law governing the relationship between the pressure and volume of gases under a constant temperature covers this point and is as follows:

"Pressure of a given mass of gas varies inversely as the volume of the space within which it is confined."

That is, if the volume of space existing under the denture consists of 1 c.c. at a pressure of one atmosphere, when increased to 2 c.c. of volume the pressure according to this law would be one-half of an atmosphere.

Since we know the relation or state defined as adaptation not to exist when an artificial denture is first introduced into the mouth, and until adaptation evolves by wear, permitting the tissues, as they do, to fill in and shape themselves to conformity and apposition with the surface of the base, we also know that during this introductory period, so to speak, while the tissues are adjusting themselves, establishing adaptation or the relation termed basal seat, partially evacuated space or spaces exist between the base and jaw about areas not in sufficiently close apposition to establish adaptation. Therefore, in this connection, it is conceded that atmospheric pressure is an aiding force retaining a denture conjointly with adhesion and cohesion. Also does it solve the perplexing puzzle of why many dentures lose their fit—so called. Nature responds to the negative pressure of evacuation, the tissues fill in and obliterate the space or spaces and the force of the atmosphere becomes nil and the denture is retained in the position of basal seat by adhesion and cohesion only.

Extent of adapted tissue surface then, determines the relative extent of the respective forces exerted by adhesion and cohesion retaining the artificial denture.

Peripheral construction and adaptation for a seal and valve-like action with the flexible peripheral tissues, sealing space occurring between the base and jaw created by displacement of the denture, preventing the ingress of air, forming a relatively increasing evacuated space indirectly applying the force of the atmosphere thereby, aids in preventing partial and complete dislodgement of the artificial denture should displacement occur. .

DENTURE ADAPTATION.

The ideal construction then, for the maximum utilization of the

forces of adhesion, cohesion and atmospheric pressure for the retention of an artificial denture against displacement, partial and complete dislodgement, is to have the base cover the entire surface of the jaw, and to add to the base a periphery, extended upon and adapted to the flexible peripheral tissues sealing the peripheral border with the flexible peripheral tissues.

Credit for the idea of constructing and establishing such relations between the base, periphery, jaw and flexible peripheral tissues, should, in so far as our information dictates, be given Dr. W. V-B Ames, of Chicago, for it was he who first conceived of their importance and in 1885 (*Independent Practitioner*, July) demonstrated their principles. Others notable in early appreciation and use of these principles, were the Greene Brothers, of Missouri, and special admiration and appreciation should be held for their untiring, constant and persistent labors for their adoption. Credit belongs to these men, so we understand, for the correctible compound method. Also the excellent work of Mr. Samuel G. Supplee, of New York, on the technic in the use of modeling compound should not be overlooked. The great good he has done in directing us to a better understanding of its manipulation and possibilities should be appreciated. Through his work and efforts our knowledge and technic in impression taking has been greatly improved.

The method of denture construction to be illustrated and described permits, it is believed, of a much infinitely greater surface tissue adaptation and wider range of movements of the denture without causing displacement and unsealing or breaking of the peripheral tensile valve seal than is secured in less accurate methods of construction in the old method where peripheral adaptation and valve seal are entirely absent and the edges of the denture permit the ingress of air and dislodgement of the restoration.

CLASSIFICATION OF JAWS.

To fully utilize mechanical and physical forces in the retention of artificial dentures, one should know what jaw conditions favor and what conditions do not favor retention. To this end adoption of a classification of jaws and standardization of their requirements is, in the opinion of the essayist, not only desirable, but essential to a better understanding of denture construction and retention.

Here, again, the efforts of Mr. Samuel G. Supplee should be appreciated. The illustrated folder he has recently given out, treat-

ing upon classification of edentulous jaws, carries much valuable information.

That edentulous jaws may be classified and divided into two general groups, is true, and that through such classification we shall be directed to a better understanding of the physics, mechanics and general conditions governing full denture retention is equally true. Also, that through such understanding definite lines of procedure may be formulated and each class rationally treated thereby.

Class 1 may be designated as that type of edentulous jaws that may be classed as normal—jaws with well defined ridges and normal quantity and tone of the overlying and adjacent tissues.

Class 2 may be designated as that type of edentulous jaws that are abnormal—jaws with poorly defined or excessively absorbed ridges, marked distortion or loss of facial contour and abnormal or subnormal quantity and tone of the overlying and adjacent tissues.

Class 1 jaws offer the greater amount of surface for adaptation, consequently greater aggregate physical forces for denture retention. The well defined ridges in this class also offer mechanical retention, assisting in securing the denture against horizontal mobility, and often, in the case of undercuts, secure the restoration against vertical movement. These, together with the ideal cushion support offered by the normal overlying and adjacent tissues, make Class 1 jaws easy of artificial denture retention.

Jaws of this class may be and are usually fitted with the most indifferent construction and adaptation, most any kind of an impression and construction serving to produce passable retentive results. Retention in this class is not so dependent upon peripheral construction and peripheral valve seal, nor is particular arrangement and efficiency of the teeth especially essential to passably satisfactory retention.

Class 2 jaws are *entirely dependent for retention upon the physical forces alone*, no mechanical retention whatever is afforded in this class. Jaws of this class require for their successful management the closest adherence to every detail of the mechanical relations of the dentures to the tissues and to one another. Peripheral construction and peripheral valve seal should be carefully and positively secured. And in case of the upper jaw, peripheral valve seal upon and about the flexible tissues of the soft palate under considerable pressure, is strongly indicated. Insuring as nearly as

possible in this, the most difficult region for maintenance of adaptation of the periphery of the denture with the flexible tissues, a perfect valve seal against the ingress of air upon displacement and partial dislodgement of the denture.

The greatest care should be given the selection of the teeth in this class. Teeth with long, sharp efficient cusps should be employed, that the forces necessary to the functions of efficient incision and mastication may be minimized. And lastly, but in no wise less important, is the anatomic relations of the teeth. These should be carefully worked out, their aid in increasing the efficiency and balancing the dentures in the process of incision and mastication determines in a very great measure the success of denture construction.

IMPRESSION TAKING.

The basic essential in the taking of a perfect impression for full and complete utilization of the jaw and flexible peripheral tissues desired to be utilized for the adaptation and retention of an artificial denture is a tray suited to the case. It is my belief that the only accurate and satisfactory way to procure a suitable tray, is to construct a special tray for each individual case.

IMPRESSION MATERIAL.

Plaster of Paris, mixed to the correct consistency, is far more yieldable and adaptable than any other material with which we are familiar, and by the aid of a correctly formed individual tray, may be handled with such control that any desired form of impression may be secured. The particular feature of "post-damming" or adaptation under pressure upon the flexible tissues of the soft palate, however, seems best accomplished with modeling compound.

INDIVIDUAL TRAYS.

For the construction of individual trays, we use the S. S. White Impression-Tray Compound, which was suggested and prepared for the particular purpose of making individual trays quickly, efficiently and economically. It is jet black in color to make it readily distinguishable; has a high melting point to assure, when set or hardened, ample rigidity against distortion in removal from the metal tray and subsequent shaping and handling.

It is necessary in employing the impression tray compound to have a few regular trays of suitable forms and sizes. Select a tray of the proper shape for the case, but somewhat larger than you

would ordinarily use. Fill the tray with the compound, softened in hot water. Pass the exposed surface of the compound over a Bunsen or alcohol flame to remove inequalities in the surface and give it a glaze. Plunge into hot water to wet the surface and prevent sticking to the tissues, and as soon as it cools to a bearable degree insert in the mouth and secure a compound impression in the regular way. In a short time it can be removed from the mouth and placed in cold water to harden.

Remove the impression from the metal tray, and with a sharp knife, trim away the excess compound approximating the peripheral outline and contour of the proposed tray. (Approximating the contour of the proposed restoration in the tray should be credited to Dr. M. M. House, of Indianapolis, Ind.)

TRIMMING THE UPPER TRAY.

Beginning at the labial margin, the tray is trimmed thin at the labial frenum, and the frenum allowed liberal relief. Passing on to the region formerly occupied by the cuspid teeth on either side, the tray is given a gradual fullness or prominence, restoring the cuspid eminences. The tray should be as high and full in this region as may be required to lift or displace the tissues for retention of the proposed denture and restoration of disturbed facial contour—the idea being to accentuate—build up the jaw ridge, increasing its area, and make in the finished impression the desired facial restoration.

Passing posteriorly from the cuspid eminences or about midway between the cuspid eminences and the tuberosities, we find the malar process of the maxilla, which registers a downward curve in the compound impression. The process is thinly covered with tissue and disposed at an unfavorable angle to permit of much vertical movement or bearing of the denture in this region and undue pressure of the same should be avoided.

Moving posteriorly of the malar process, a well defined cavity, as a rule, is found, and offers extremely valuable area for peripheral adaptation and denture retention. This space may be called the buccal cavity, and defined as the cavity formed or bound by the malar process, the check, the angle of the mouth and the tuberosity. It is indeed amazing how little this valuable space is utilized, and on the other hand quite astonishing how extensively it may be utilized.

In forming the tray for this space, allow it to go well up into

the cavity, filling it buccally as well as vertically, preferring, however, to accentuate or favor vertical height rather than buccal fullness. Next, outline and trim the posterior or palatal border of the tray. The outline of the tray should approximate that of the junction of the hard with the soft palate. Its length, however, should extend well upon the soft palate, the exact length of which will be determined in a later operation. Finally, cut out the tray relieving locks about undercuts and points of impingement upon soft, flabby ridge tissues allowing them to hang freely in the tray.

Construction of dentures for upper jaws not requiring facial restoration or permitting presence of base and periphery upon the tissues in the labial region of the jaw and flexible peripheral tissues, do not permit peripheral adaptation in the buccal areas under pressure upon the flexible peripheral tissues. Construction and adaptation of periphery upon the flexible peripheral tissues in the buccal areas are desirable, but care should be exercised in preventing pressure, the positive force thus created by displacing the tissues would react against retention of the denture and would not, in the absence of periphery and peripheral valve seal in the labial region, be met with an overcome by atmospheric pressure by the forming of an emergency vacuum upon displacement of the denture as in the case of that afforded where peripheral construction and valve seal are complete and perfect. This class of cases may be properly subclassed and would come under the subclass of class 1 jaws.

TRIMMING THE LOWER TRAY.

The general preparation of the lower tray is the same as that of the upper. The lower jaw, however, has its individual characteristics. One is that absorption takes place in such manner that the curve or circumference of the ridge remains practically unchanged or fixed. Whereas, in the case of the ridge of the maxilla, absorption reduces its circumference quite extensively. Consequently facial contour is less disturbed in the loss of the lower teeth than of the upper. Therefore, less fullness is required in the lower denture for the restoration of disturbed facial contour than in the upper.

The lower jaw, like the upper, also has much over-looked and neglected valuable surface and flexible peripheral tissue surface for base and peripheral adaptation for denture retention. Aside from our general failure to utilize the available area, the lower, like the upper jaw, has, as a general rule, two spaces that are much over-

looked. These may be called the lingual spaces. They lie on either side of the tongue and are bound by the mylohyoid ridge, the floor of the mouth and the tongue. These spaces are, when present, and utilized, valuable aids to denture retention in those excessively absorbed cases, or so-called flat jaws. Fit the tray well into these spaces, aiming to utilize them in the completed denture. The supporting foundation or ridge of the lower jaw is more or less circular back to the region of the first molars. The diverging flanges formed by carrying the base of the denture into these lingual cavities will act as tangents to the circle and prevent or assist in preventing, horizontal movement of the circular base.

The individual tray being approximately outlined, is now ready for final shaping and conformation to the tissues.

SHAPING AND CONFORMING THE INDIVIDUAL TRAY.

Shape and conform the tray to the tissues without undue pressure or fullness, but under just that degree of pressure and fullness as may be indicated and desired. There are ways of best conforming the periphery of the tray to the flexible tissues. One method is that of the late Dr. Greene, previously referred to, and is no doubt familiar to most of you. The method consists of heating the edge of the black compound tray, and when necessary, tracing modeling compound upon the edge of the tray (tray of Impression Tray Compound the same as upon the edge of a metal tray) and while hot and plastic inserting the tray in the mouth and having the patient make movements of the muscles which in turn causes the softened tray edge to flow and conform to the tissues.

The other method in its application to the upper jaw consists of successive layers of very thin plaster. As a rule only two mixes are necessary. The first mix registers the position and approximate extent of the imperfections of the improvised compound tray. Where the tray is too long or impinges, the plaster is displaced, and where too short, plaster is added. The tray is freed of excess and points of impingement are cut away to free the tissues impinged. The tray made up partly of tray compound and partly of plaster may now be considered perfect and is ready for the second mix of plaster with which we plan to secure an accurate impression of the jaw under such displacement and pressure upon the tissues as previously decided advisable and predetermined in the preparation of the individual tray.

Since adaptation under pressure upon the flexible tissues of the soft palate is a prerequisite to retention in its maximum degree; and since there is no means of confining or restricting the escape of the flowing thin plaster from the tray about the tissues in this region, as in the case of the labial and buccal borders where the tray is overlapped and bound in by the tissues of the cheeks and lip, it is obvious that adaptation of the palatal border of the denture under pressure upon the soft tissues must, if accurately made, be secured by means of some plastic material the flowing stress of which offers such resistance as may be required to give the desired pressure upon the tissues.

Modeling compound seems to be the ideal material for use in this connection.

The Foveola Palatine (Raubert Kops' Anatomy) indicate the junction of the hard with the soft palate in the median or at the palatal suture. The Foveola Palatine and the general demarcation between the hard and the soft palate are more accurately outlined in the thin plaster impression just described than with any other method with which we are familiar.

These indications together with those distinguishing the tuberosities are taken as guides by which the outline of the soft palate and the length of the base of the proposed denture may be definitely determined.

The posterior border or length of the impression and tray are cut off conforming their outline to that of the junction of the hard with the soft palate, trimming them to such length as it is desired the finished denture should be.

The remaining outlined plaster representing the impressed surface of the tissues of the soft palate and the extent of this area it is decided the base of the proposed denture should cover, and which it is also desired adaptation of the same should be under pressure, is next entirely cut away and the black compound of the individual tray exposed.

Modeling compound, preferably Kerr's in stick form, is softened with dry heat and traced upon the top of the exposed projecting surface of the black tray. The impression is next dipped into warm water to saturate the plaster and prevent the compound sticking to the tissues when it is inserted into the mouth and adjusted to place. Adjustment of the impression to its seat is made

as the varying temperature and flowing resistance of the compound against the tissues being impressed may indicate, to effect the required amount of pressure upon the flexible peripheral tissues of the soft palate as adjustment of the impression to its seat progresses.

Securing adaptation under pressure upon the tissues of the flexible, soft palate by this or some equally scientific means, insuring tension of the tissues under equalized pressure is strongly advocated.

Pressure engagement of the periphery of the denture with the tissues by molding or swaging the base upon casts that have been altered by cutting and scraping to increase the extent of engagement of the periphery with the flexible peripheral tissues, is guesswork and unscientific. The frequent injury of the tissues and the suffering imposed by such practice evidence the empiricism of the method and warrant discouragement of its practice. Casts made from accurate impressions secured in accordance with the demands of the case require no cutting or scraping.

Careful study and outline of the hard palate should be made and generous relief of any pressure of the base of the proposed denture upon this area should be certain. Otherwise, pressure of the base upon the tissues of the hard unyielding area may establish a fulcrum, cause rocking of the base and impair the stability of the structure.

FORM AND ARRANGEMENT OF THE TEETH AS AN AID TO DENTURE RETENTION.

ANATOMICAL OCCLUSION AND ARTICULATION.

My understanding of the meaning of the term anatomical occlusion and articulation is, that the teeth, during movements of the mandible, when in the varying position in the process of mastication, should be so arranged that the cusps of the teeth of the opposing jaws shall establish such relations of contact between them, while gliding to the position of fixed occlusion that varying spaces should be formed to cut, crush and grind the food as the closure of the teeth progresses, providing, thereby, points of support aiding in retention of the dentures, by contact of the antagonizing cusps, with spaces for food.

If this be true, I want to go down in the record of the proceedings of this meeting as saying that, in my opinion, we have had up to this time, no anatomical occlusion and articulation.

The use of the face bow; the measuring and recording of the condyle paths; the movements of the so-called anatomical articulators; the setting of teeth to theoretically determined planes and curve in wax to the arrangement known as three-point contact, have all been productive of nothing in assimilating anatomical occlusion and articulation. Therefore, no aid to denture retention through this supposed source has been an actual reality, and those advocates and followers of such theories and practices have, in my opinion, been running wild on a delusive theory.

These theories, in part, teach that the general plane of the teeth should be arranged, irrespective of the alveolar ridges, parallel with a line drawn from the ala of the nose to the tragus of the ear. This and its associate rules have long since been found wanting and have not been, nor to my mind will they ever be generally accepted. Although, from the voluminous literature upon the subject, and especially the work and claims of one of our manufacturers, one would be led to believe that the last word on the subject had been said and perfection of its practice attained. Few there are, comparatively, however, that have adopted and are practicing its teachings, and these few will, in time, like the rest of us, discover its shortcomings and abandon its practice. So we shall share the keenest pleasure in the disappearance from our text books and literature of these much overworked theories, that we may not be further misguided into error.

Do not be discouraged, however, for there is such a thing as anatomical occlusion and articulation, and when such form and relations of the teeth are secured, not only greater efficiency, but extremely valuable aid to denture retention results. It is my opinion that the form and arrangement of the teeth in Class 2 jaws are as important and share equally in importance with that of the construction and adaptation of the base and periphery of the denture.

What, then, is anatomical occlusion and articulation? How, and by what means, may we arrange teeth anatomically, so as to secure greater efficiency and their aid in the retention of artificial dentures?

Anatomical occlusion and articulation means that the artificial teeth should be so formed and arranged that they will occlude and articulate without undue interferences, aid in retaining the dentures under the stress of the forces of incision and mastication, guide the

co-ordinate muscles in directing the movements of the mandible and at the same time, in the positions of relations of articulation, provide spaces for food.

Teeth may be anatomically arranged by having an articulator capable of imitating all of the movements of incision and mastication of the mandible and then have these movements under such control that we may utilize them for the perfect positioning and grinding of the teeth in anatomical relations as guided by the esthetics, the alveolar ridges and the movements of the articulator.

Present teachings and practices are now wrong. First, because of faulty methods and articulators. Second, because the cusps of the teeth now upon the market are not long enough to permit meshing or interlocking so that in movements of the mandible they will reach and maintain contacts with their antagonists, provide adequate spaces for food and balance the dentures under the stress of the forces of mastication.

Teeth with deep angular cusps (guiding angle 45 degree), correctly arranged, balance the vertical and lateral or horizontal movements of the mandible, as typical to nature, when in the stage of greatest efficiency; definitely guide the co-ordinating muscles in directing the movements of the mandible, also typical to nature; provide spaces for food; balance and support the dentures in the process of incision and mastication; and in case of dislodgement of the dentures, steady and guide their return to their normal position comparable with the guiding and supporting influence of the rails of the railway track upon the coach, the rails, the lower teeth (high cusps), and the wheels, (their flanges, long cusps), the upper teeth. The train without the flanges upon its wheels to secure and guide the movements upon the rails (movements of the mandible in the case of the masticatory apparatus) would leave the track, not travel its intended course and be a failure. Likewise we must justly and logically regard the principles involving the construction and uses of artificial dentures if we are to expect them to work to perform the function of incision and mastication efficiently, and not be a failure.

Especially restorations required in Class 2 jaws: We must, therefore, incorporate or provide in their construction, suitably formed and correctly arranged teeth or they will not be guided and supported in the functioning movements of the mandible and will

be a failure to such degree as they may be deficient in the requisite fundamentals to the highest and most efficient type of denture restoration.

In our latest edition of a prosthetic text book, we find and quote the following:

"Let us consider the relation of the mandible to the maxilla, first, with the natural teeth present and in occlusion, and second, after the jaws become edentulous. In the first instance the masticatory muscles bring the mandible upward until when the teeth are in occlusion it is in a state of rest. In this position the facial profile is normal, while the lips rest easily against each other without apparent muscular tension, or conscious effort on the part of the individual."

In the above quotation we note the author states that when the teeth are in occlusion, the mandible is in a state of rest. If there is anyone in this audience whose mandible, when the teeth are occluded, is in a state of rest, please make the fact known in the discussion following this paper. It will be the first one I have ever known.

The teeth are occluded through muscular effort only, therefore, the mandible could not, in the position of occlusion of the teeth, be in a state of rest.

We note further that when the mandible is in this position (position of occlusion of the teeth), "the facial profile is normal, while the lips rest easily against each other without apparent muscular tension, or conscious effort on the part of the individual."

Since the normal facial profile is that of the features when the muscles are relaxed and in a state of rest; and since it is true that, normally, the mandible is not in a state of rest when the teeth are in occlusion, we must conclude that the rule of determining the length of the bite and subsequent positions of the proposed teeth according to the above indications, are not esthetically or anatomically correct.

The present rule is to set the teeth to approximate a length in line with the lips and not overlap the upper or under-bite the lower anterior teeth to any considerable degree, owing to leverages that would be formed, dislodge the dentures and break off the anterior teeth.

This would be a very fine rule if turned the other way around.

The rule is absolutely wrong and its application is the greatest cause for dislodgement of dentures and breakage of anterior teeth. Why? Because, to set the anterior teeth in line with the lips and not permit them, when occluded, to pass or overlap as in nature, means simply that the molars and bicuspid have to be raised and lowered to occlusion to a bite corresponding in distance between the ridges with the incisive bite, instead of the occluded bite. In other words, following this rule produces dentures the presence and operation of which in the mouth force the bite open to the extent of the depth of normal overbite and interfere with the movements of the mandible, and the patient experiences a feeling that the mouth is held open and the teeth are too long. Therefore, teeth so arranged do not efficiently restore the function of incision and mastication, and the excessively long molars and bicuspid interfere in the movements of incision and mastication, and impair retention of the dentures.

In the absence of overlapping anterior teeth, as normal to nature and necessary to the function of incision, the patient manages to find a point of contact between two of the opposing end to end related incisors and in their effort to incise it is discovered that the teeth do not slide by and shear the object attempted to be incised, but merely pinch or puncture it, and in this predicament the patient thoughtlessly, though naturally, pulls the object in two, with the frequent result of a broken tooth.

The incisors, if correctly arranged to overlap, and ground to establish perfect opposing articulating edges and planes, will, with the minimum amount of pressure, efficiently perform the function of incision and equally distribute the pressure upon all the anterior teeth. And in so arranging them the molars and bicuspid will be relatively shortened and normal anatomical relations restored.

Teeth should be so arranged that they conform to the esthetic, anatomical and physiological needs of the patient.

The misleading and absurd rule that confines us to a definite line of procedure in obtaining the relation the teeth and jaws should bear to each other, irrespective of the modifying influences of the individual patient, should, in my opinion, be disregarded altogether.

Each case of denture construction is a law unto itself and no rule of averages, be it ever so inclusive, can possibly supplant or adequately supply the specific demands arising in the individual case.

The rule that the length of the teeth should be established in accordance with the lips when in position of repose, is no less impractical than is the rule of establishing the occlusal plane.

The misleading feature of this rule, by which we are supposed to determine the length of the teeth, is due entirely to the fact that the rule does not conform to the conditions imposed in nature. When the muscles controlling mandibular movements are in a state of rest the lips normally are extended to their full length. The muscles controlling mandibular movements are not constantly contracted—nature could not tolerate a constant contraction of these muscles—and in their unfunctionating state the mandible hangs down to the extent of relaxation of the suspending muscles and tendons and the teeth are not normally in occlusion. The reverse of this normal repose in lip position would be found when the teeth are occluded and the lips are compressed and much shortened. It is my idea that the latter position of the lips more nearly indicates the length of the bite when the teeth are in occlusion than does the position of the lips when the muscles are relaxed and at rest.

I have dealt at length on this particular point because it will help to emphasize the things I am contending are wrong in respect to some of the rules and theories heretofore set down as definite facts, which in my judgment, are very great hindrances to our success and advancement in the art of denture construction, both as regards retention and efficiency.

THE CAST GOLD INLAY.*

BY DR. MORTON H. MORTONSON, MILWAUKEE, WIS.

Mr. President, Members of the Missouri State Dental Association,
Ladies and Gentlemen:

Never in the history of dentistry has anything been given us which has so revolutionized our work as has the casting process. It has made possible many things which before were impossible, and in the great majority of cases, many things which were inconceivable. It is responsible especially for the great progress and advancement

*Read before the Missouri State Dental Association, April, 1918.

made in restorative dentistry. By restorative dentistry I mean the operative, the crown and bridge, and the prosthetic.

We are to consider today the gold inlay. We all know how it has made our work less hazardous. Our patients also know this to be true from their viewpoint. We or our patients do not now dread the long, tedious hours that are required in making a large gold foil restoration. It was good at the time, and beautiful results were obtained. Detail in every step was essential, or good fillings could not be, and were not obtained. This same thing applies in as great, or even greater measure to the gold inlay. It is with reluctance that I say a large percentage of inlays fail. Why is this true? It is true because wherever we have a failure we have a case where there has been a lack of detail somewhere in the technique. It is not with the process, it is with the operator. Why with the operator? Because of the lack of a simple, well-defined, exact technique, which, with proper detail, will result in perfect restorations in all cases.

A perfect inlay can be made, but in order to do so there must be a proper technique with the application of detail from beginning to end. This technique must consist of:

1. A proper cavity preparation.
2. A good wax, and the proper manipulation of it.
3. Investing.
4. Burning out.
5. Casting.
6. Finishing and cementing.

On account of the limited time allotted it will be necessary to be brief. I will not go into the detail of cavity preparation, except to state that the system of cavity preparation given us by Dr. Black is essentially the same, with but few modifications, as that required for the gold inlay. The most important modifications being the total elimination of under cuts, and the changing of the bevel from a short to a long bevel extending through the enamel, and often into the dentine, as the case may require. These points will be more clearly brought out in the slides which are to follow, and also in my table clinic this afternoon.

After proper details have been carried out in our cavity preparation, our next consideration is the selection of a good wax and the proper handling thereof. After several years of experimenting with the various inlay waxes, we have discarded all with the exception

of two, Kerr's Blue Wax and Taggart's. These we use in combination.

We will now follow in detail the technique required in making a gold inlay for a mesio-occlusal cavity in an upper molar. A generous piece of Kerr's wax is softened over a dry heat and forced into the cavity, the patient being requested to bite into it, chewing as it were, until the wax becomes moulded into proper occlusion. This is now chilled, to avoid distortion, and carefully removed from cavity. With a sharp Volland lance, cut away excess of wax at the gingival which has been forced into the interproximal space. Next heat and flow a small quantity of Taggart wax on the gingival surface, and while soft replace in the cavity, requesting patient to again bite firmly. This is the only place where Taggart's wax is used. We use it here because it is a trifle softer than Kerr's under the same temperature. Now remove the wax from cavity, and if a sharp, well-defined impression of the gingival margin is not obtained, repeat process of adding Taggart wax until the desired result is accomplished. Having accomplished this, we now take our lancet and trim the proximal surface of our wax model to the gingival line. The object of adding the Taggart wax is not only to secure a perfect impression of the gingival margin, but equally, if not more important, to secure a density, by compression, of this portion of the wax model. We believe that the cement line so commonly found at the gingival margin is due approximately to about 9/10 shrinkage in this portion of the wax, and to the fact that usually this is the only part not brought under pressure or put to place. We grant that the other 1/10 is due to shrinkage in the gold, but do not grant that the shrinkage in the gold is any greater at this margin than at any other margin of the inlay. After trimming the wax to the gingival line and finishing the proximal surface, proceed to cut away the bulk of wax generally, being careful not to approach the margins too closely.

Now replace model in cavity and finish carving in the mouth. Do this in detail, leaving no over-hanging margins at any point. Reproduce the anatomy of the tooth in detail. Whatever you have in your wax you will have in your casting. A perfect wax model means a perfect casting. In order to avoid handling the wax model from this point on, we insert a sprue while model is still in cavity, placing same parallel to the long axis of tooth. The wax model can now

be withdrawn without any danger of distortion. Now place on conformer and invest immediately. Invest immediately because, owing to the peculiar nature of all waxes, there is a tendency toward certain changes, varying according to atmospheric conditions.

The technique of investing is very important. First, a good investment must be used. There are undoubtedly a number of good investments on the market. We prefer one of our own which is the outcome of a great deal of experimenting with different combinations of materials. This we have found to give perfect satisfaction in our hands.

The formula is as follows:

XXX Lithowhite (Silex), 3 parts; Kerr's Snowwhite Plaster, 1 part; Brophy's Imperial Investment Compound, 1 part; Dixon's No. 1 Coarse Flake Graphite, $\frac{1}{2}$ part. Formula by measure.

This is mixed to a smooth, creamy consistency, about two minutes being required for proper mixing. After allowing mixture to stand for five or ten seconds, take a small camel's hair brush and paint the entire model carefully with the smooth portion of the investment which comes to the surface. Now place ring and fill. Avoid all jarring as this has a tendency to cause the air in the investment to form small bubbles which in their journey upward are deposited on the lower surface of the model and there reproduced in the casting. Now let it stand for not less than ten minutes, preferably fifteen, before placing over heat.

In burning out we use a Hot Point Electric stove with a three heat control. On this is placed a layer of asbestos paper, and over this a metal cover, making virtually an oven. The time consumed in burning out wax properly is about one hour, using the third heat or low control. At this point there should be no fumes coming from the flask. The fumes having passed off, a deposit of carbon is left in the investment immediately surrounding the mould. This deposit of carbon acts as a deoxidizing agent, and the result is a clean, bright, smooth-surfaced casting. Up to this point, if our technique has been carried out carefully and in detail, the success of our inlay has been determined. It matters not what force is used, whether air, gas, steam, suction or centrifugal. The all important factor is a proper technique to the point of casting. Personally, we prefer centrifugal, because it is always ready.

Regarding the gold used, will say that we prefer a 5% platinized

gold made from 22 Karat, Silver alloyed, plate and platinum. This makes a very hard, dense gold, good as to color and a gold that can be used universally, whether it be for inlays, crowns or bridges.

We have now brought our inlay to the point of setting. Many a good inlay becomes a failure due to a lack of a proper technique in finishing. In the preliminary dressing, great care should be taken to avoid coming in contact with the margins at any point. The inlay is now placed in the cavity and the final setting accomplished by gently malleting. An S. S. White wooden mallet No. 1, and an orange wood stick are used for this purpose. The final dressing is now completed in the following manner :

Gem points and discs are used, revolving toward the enamel, the gem points being used on the occlusal surface, medium and fine garnet discs on the buccal and lingual margins. This should give us an inlay with no over-hanging margins at any point, the gold being in absolute contact with the tooth structure, so that no break in the surface continuity can be detected by the finest explorer. The reason for the final dressing of margins before cementing is that after the cement is between your gold and enamel, it is impossible to finish the gold to perfect contact with the enamel on account of the cement. The inlay is now removed and the final finishing and polishing of the proximal surface completed. This should be done in detail, as we do not want to touch this surface in the mouth after the final setting.

Our cavity is now dried and the inlay set, being gently seated or put to place by again using the mallet and orange wood stick. After the cement has become thoroughly hardened and the excess removed, the final finishing and polishing is completed, giving us a restoration, I believe, which for its usefulness and permanence can not be surpassed or excelled in dentistry.

GOLD FOIL.*

BY DR. G. B. BAIRD, FREMONT, NEBRASKA.

To fully appreciate the extent of your knowledge on the subject of "Gold Foil" and its use, I deem it advisable for anyone to

*Read before the Missouri State Dental Society at Columbia, Missouri, April 2, 1918.

accept an invitation to write a twenty-minute paper on the subject and present it to an intelligent body of men—a great many of whom have not been able so far to see the real merits of this valuable material and who are just as sincere in their desire to render the very best service possible for the benefit of their friends and patrons as the author. Twenty minutes is a very long time to write on a subject of such vast importance as gold foil. It is impossible to do yourself or the subject justice in that length of time and owing to my inability to handle the subject, twenty minutes is a long time. If I only had an hour to live I would prefer spending part of it writing on the subject of gold foil. The time would pass less rapidly and I expect to a great many of you an hour spent in working gold foil would detract a little on the time limit of eternity—in other words, eternity would lose some of its charm for length. To me the greatest joy I get out of my practice is making gold foil restorations. If I had to give up gold foil, I honestly believe that I would quit the profession. There is no limit to the skill and real art that can be developed in the building of a gold restoration. Here a man can give expression to his very highest ideals. What is more beautiful and artistic than a perfect gold foil restoration? In it you can read the character of the operator as you would in an open book.

Not long ago I saw some very beautiful gold foil restorations. They were artistic, they showed temperament, character and that the thought of the operator was not guided by hate, envy or jealousy but by kindness and love for his fellowmen. He was exemplifying the golden rule: "Do unto others as you would have others do unto you." No other operator, no matter how skilful, could make restorations just like those. He could not build in his work this man's character, his ideals, because no two people are alike. Understand, he might build as well, but the same personality would not be there. And to build as well he would have to love his fellowmen—for, this man does.

I am thinking of Dr. Prime. He is preaching and teaching gold foil because he believes that gold foil is the greatest material in the world at the present time for the restoration of lost tooth structure and there are other men that I could name that are doing the same. I would not infer that there were not other men just as good and with just as good intentions that are not using gold foil, for there

are, but to my mind there is no other material equal to gold foil. There are other materials that are handled very skilfully and that are indispensable even in the hands of the most skilful foil operators. They wouldn't care to give them up owing to many places and conditions where gold foil is not indicated, but I believe there are many places where foil is indicated but not used. For that reason I am here today to try to encourage a more extended use in your practice of gold foil. I do not expect to teach you anything in technique of handling gold foil. That comes only by your own application but I will endeavor to show you who are interested some steps in the manipulation of foil in my clinic. To all of you who are interested in the study of gold foil I will be glad to give any information I can of how best to go about to get the desired results.

Why should we encourage the use of gold foil? In all fairness to ourselves and patients, let us study this vital question, what do we seek to accomplish in a filling operation? Is it not to prevent caries from destroying the dental pulp? To permanently stop ravages of decay; to restore the lost tooth structure and to restore the tooth to its original form, viz., normal occlusion, normal contact relation, natural contour of the tooth and a permanent restoration. With what material can we best accomplish the desired results?

PHYSICAL PROPERTIES.

The qualities most desired in a filling material for permanent operations are: Indestructibility in the fluids of the mouth; adaptability to the walls of the cavity; freedom from shrinkage or expansion after having been made into a filling; resistance to attrition, and sustaining power against the force of mastication.

The qualities of minor importance are color, appearance, non-conductivity of the thermal impressions and convenience of manipulation.

GOLD.

Of these qualities gold foil seems to possess those most essential in much the greatest degree: It is perfectly indestructible in the fluids of the mouth; it is perfectly adaptable to the walls of the cavity; it is free from objectionable shrinkage or expansion; its resistance to attrition is good and it sustains the force of mastication better than amalgam.

ITS GREATEST VALUE.

The greatest value of gold as a filling material lies in the fact

that it may be adapted to the cavity walls with great force and is capable of immediately and permanently sustaining that force.

ADAPTATION.

Better adaptation may be obtained by gold foil than with any other material. By proper manipulation it can be built against the cavity walls with much force, gradually spreading the dentin which is very elastic—securing a permanent gripping of the tooth to the filling making a perfect joint that will resist the entrance of moisture or bacteria; and prevent discoloration of the tooth and afford protection to the dental pulp. It is this quality in this with its relation to the quality of elasticity and strength of dentin or the mutual relation of these in the two substances combined with the indestructibility of gold that renders gold foil so preeminent as a filling material. No other known filling material can be so worked against the walls of a cavity as to make such use of the sustaining power of the elasticity of the dentin. I think the great Architect of the Universe may have had this material in mind, so harmonious is the relationship of the physical qualities of these two substances in conjunction with each other.

EXCLUSION OF FOIL.

Now the question for your consideration: Are the above statements true? Yes. Then why is gold foil being excluded for inferior materials and methods in the restoration of lost tooth structure? I realize there are many places and conditions under which gold foil cannot be used. More places perhaps than would have been, had a good permanent gold restoration been made in the early stages of the decay.

FOIL OPERATION.

Is the cavity preparation more severe in a foil operation than for amalgam or the inlay? I would say, no. For amalgam you require bulk of material for strength which necessitates a deeper and wider cutting of tooth structure. For the inlay it requires more extravagant cutting of cavity walls to allow the removal of the wax model and the replacing of the cast. For the foil we can conserve tooth structure as it does not require the bulk for strength as with amalgam or the necessary wide cutting to accommodate the removal of wax, or replacement of bulk of cast gold. So we can safely say that the cavity preparation is less severe for the foil operation than either of the others. Some man in Nebraska will say that

the long siege of malleting in a foil filling kills off my patients, they won't stand for it. I might say that quite an extensive filling can be malleted in in 20, 30 or 40 minutes. My patients will stand for it. I will say that I have had more than one patient go to sleep during the malleting of a foil restoration. I really think that the finishing is the hardest part of a foil operation. This may be obviated to a great extent by a more careful use of the plugger in condensing and building to tooth form. I will show this in my clinic this afternoon. After developing your technique to a certain stage of efficiency, I doubt very much if the foil operations are more severe on the patient than any other operation covering a like period of time.

A few days ago I heard this argument: "In your hands you may be able to get better results with foil but not in mine." Dr. Prine answered the argument this way: "If you had used the same care in developing your technique in foil you would be able to get better results with foil and if you want to give your patients the best service possible, which they are entitled to, you owe it to them and to yourself especially to study gold foil and develop your technique to the last degree of efficiency." I think the reason a great many men do not consider gold foil more seriously is the impression they get in making their first filling while in college—the instructor tries to impress upon the mind of the student (and the instructor may be a poor operator himself) the great difficulty in making a gold foil restoration. This being new work for the student and naturally very difficult he immediately gets a wrong impression of gold foil that it takes years in many instances for him to overcome. This is to be regretted. He should be taught that this was a very valuable asset and that upon mastering the fundamentals, mechanical principals underlying the manipulation of gold foil, he would possess an indispensable medium of accomplishment that would assure his success in the practice of his profession. I can honestly say that I prefer gold foil work to the exclusion of all other work in the category of the profession and I will venture to say that every student of a gold foil study club will tell you the same.

RESTORING TOOTH FORM.

Last but not least cohesive foil is the ideal material with which valuable tooth forms may be perfectly and beautifully reproduced.

The grooves, pits, inclined plates and cusps are easily reproduced; contact points restored, in all a perfect and beautiful operation that cannot possibly be attained with any other filling material. Within the scope of a 20-minute paper it is impossible to touch upon the different phases in the manipulation of gold foil, such as the different forms of gold—welding properties, lines of force, size of plugger points, and its relation to the force of the blow in condensing gold, etc. There is one thing, however, that I wish to emphasize and it is this: A hand mallet in the hand of an assistant will produce by far the best results in condensing gold and with the least wear and tear on both patient and operator.

My purpose here is to make a plea for a more extensive use of gold-foil. Why are there more study clubs on foil than any other one subject? For the reason that when a man becomes a skilful gold foil operator he has developed a certain technique that enables him to handle other operations more skilfully. Right now this State should have 20 clubs of from 10 to 20 members, studying gold foil. Get busy and organize them! You can get plenty of good teachers from other clubs who will gladly help you on the way to better things. Gold foil is the great truth in dentistry.

TECHNIC OF MAKING CAST GOLD INLAYS.*

BY LEIGHTON B. MORRIS, D. D. S., DENVER, COLORADO.

A twenty-minute paper on The Cast Gold Inlay can only briefly mention the most important points in the technic. The details will be brought out in the clinic this afternoon. Several phases such as carving of wax, and cementing the inlay have been entirely omitted.

If you are expecting me to tell you of a casting machine that you can start a wax pattern in at one end and grind out a perfect inlay at the other, like a sausage grinder, you are doomed to disappointment. Neither can I tell you of gold which does not shrink, nor cement which will hold any inlay in place.

It is entirely a question of understanding certain fixed principles and then carrying out these principles without variation.

The making of the cast gold inlay is a scientific process but it

*Read before the Missouri State Dental Association, April, 1918.

is absolutely necessary to follow very carefully a rather prolonged technic. Luck plays no part whatever; when the inlay is not a success it is always due to faulty technic.

The only thing I shall say in regard to cavity preparation is that we should follow the rules laid down by Dr. Black, with the exception that we should bevel the cavo-surface angle slightly more than he instructs us to do for foil.

WAX PATTERN.

There are two very puzzling problems in taking the wax pattern. The first is to get the gingival bevel. The writer gets the best results by melting Taggart's Wax and molding it into a sheet, then cutting this into long strips and cutting one end to a taper. This gives a pointed piece of wax which passes easily to the gingival margin. The tip of this cone may be softened over a flame. With the matrix in place this should be plunged against the gingival margin using the long hard portion of the wax as a plunger, making no attempt at this stage to bend the wax over into the step.

Hold the wax in place under pressure until it is quite hard and only in rare cases will you fail to reproduce the bevel at the gingival margin. This maintained pressure until the wax is cold also separates the teeth and takes an accurate impression of the contact point of the proximating tooth, which will give a perfect contact without soldering.

After the wax is chilled in this position soften it with a hot instrument just above the contact, bend over and press into the step, keeping the wax on the upper portion sufficiently soft so that the proximating portion will not be distorted under pressure. The wax may then be shaped as desired and the occlusion obtained in the same manner as you would for an amalgam filling.

After the occlusion seems to be accurate, soften the surface with a hot instrument and have the patient try to push the wax out with a grinding motion. This will give the planes and facets so necessary to the restoration of the occlusion and prevent undue stress from being brought upon this tooth.

The other puzzling problem is to prevent forcing the wax under the bell-shaped crown of the proximating tooth, making it impossible to withdraw the pattern without breaking or distorting.

This may be overcome by inserting a properly shaped instrument between the teeth just gingivally to the largest diameter of the

proximating tooth, allowing the edge of the instrument which is toward the gingival to touch just below the gingival margin of the cavity which you desire to inlay.

This will prevent the wax from flowing into the inter-dental space, and will also guide the soft apex of the wax cone toward the gingival margin of the cavity, producing the very desirable short thin bevel.

SHRINKAGE.

The writer does not use molybdenum or any high fusing metal to cast against for the purpose of controlling shrinkage. The shrinkage may be controlled somewhat by this method, but is usually a distortion.

To attempt to expand the wax by investing warm to overcome the evil effect of the shrinkage of the gold, also results almost invariably in a distortion and not a uniform expansion.

It is better to contend with the known shrinkage of the gold than the unknown distortion by investing warm. Successful inlays with a butt joint can be made this way but the process is not scientific and not practical.

We have all doubtless seen excellent inlays made for a cavity cut in a steel die. These may be made either by many trials at expanding the wax, or by reproducing the cavity in amalgam and then scraping the amalgam the amount you think will account for the shrinkage of the gold, then taking the wax pattern from this and making a casting.

After a little experimenting on this particular cavity you can cast an excellent fitting inlay with a butt joint, no shrinkage being in evidence. Even by using the ordinary process one can occasionally make a good fitting inlay with a butt joint in a steel die, but this can be done only when the location of the shrinkage is favorable to deceive the eye, the shrinkage taking place for the most part on the seating portion of the inlay, allowing the inlay to drop deeper into the cavity, thus seemingly casting an inlay without shrinkage.

We often find articles in the magazines telling of some dentist exhibiting perfect fitting inlays in a steel die, and the writer of the article assures us that this proves it can be done, and so it can, but only by employing a process which is not practical in the practice of dentistry.

INVESTMENTS.

Tests have shown that Taggart's investment changes shape less than any other. The coarse investments are strongest but are easily distorted under heat. They contain large quantities of soda glass which fuses at a temperature lower than that of gold. The hot gold will melt into this and produce a rough inlay. Taggart's investment remains in a fluid state sufficiently long to permit of the working out of all of the air and gas bubbles.

Investment material should be mixed only in a large, clean rubber bowl. When the investment sets too rapidly ordinary washing of the bowl does not suffice. It should be turned wrong side out and scrubbed for at least two minutes. This removes the old plaster, which if allowed to remain in the bowl will hasten the setting of the investment to such an extent that you must pour the mix before the gas bubbles are all worked out.

Plaster manufacturers use one pound of set plaster to accelerate the setting of one ton of new plaster.

The investment should be spatulated like cement, using a rubber spatula thick in the center and thin on the edges. Just in proportion as you fail to spatulate the investment you will have gas bubbles on the inlay and a soft powdery mold which will not accurately reproduce the wax pattern.

This investment may be spatulated for one minute, then jarred and rotated for two minutes. This should still leave ample time to paint the wax pattern and pour the investment. After the investment has been sufficiently manipulated it should be jarred to the bottom of the bowl. This will cause the coarser silica to sink to the bottom and a rich, creamy, oily substance to float on the surface. With a fine sable brush the surface of the investment should be skimmed and this painted against the wax.

This will produce an inlay with a bland surface which can be easily seated in the cavity with finger pressure only providing the proper technic has been observed throughout the other stages.

More than one inlay should not be cast in a single investment, as each inlay needs a large mass of investment material to support the walls.

If more than one is cast in a single investment the pressure exerted upon the gold will cause the thin partitions to either bulge or crack, distorting your inlay.

Weston A. Price says investments properly dried out will show very little change in dimensions with the best investments. The heating causes an expansion of about 85/1000 of an inch and on cooling shows contraction of about 60/1000. But if the investment be heated to 1000° F. it will never return to its original form, but will contract and distort.

The wax should be burned out within the hour of investing. If allowed to set over night there is great danger of cracking. After the wax has been burned out it makes no difference when they are cast.

CRUCIBLE FORMER.

A deep funnel-shaped crucible former should be used as this assists in carrying the gold to the sprue. The tip of the cone of the crucible former should not be flat as the greater amount of the pressure is lost in holding the gold against this flat portion instead of centering it to the sprue as is the case when the cone is not flat.

A crucible should not be cut out after the investment has hardened, as this disturbs the bland surface and exposes the coarser silica to the hot gold where it may be melted. The silica itself will float on the surface of the hot gold and possibly do no harm, but the iron which it contains will contaminate the nugget, making it hard, brittle and sluggish, which is an undesirable property. This increases the distortion and by its hardness makes the inlay more difficult to seat, and interferes with the burnishing of the margins.

The investment should be thoroughly hard before it is put near the heat, for if the moisture is driven off too soon crystallization will not be complete and you will have a more or less chalky mold.

BURNING OUT.

The wax should never be burned out by any method which permits the flame to come in contact with the investment.

The burning-out should be done in a small enclosed oven. The first 12 minutes of the burning-out process should be done with a flame not to exceed one inch in length. This will drive off the moisture. Then a flame with heat about double that of the first flame should be used for five minutes. This will not cause the wax to boil out, but will melt it causing it to permeate the investment.

The third and final heat may now be turned on. This in intensity about doubles the second heat. When the wax has permeated the investment it is impossible to boil it out. The danger in boiling out

the wax is due to the tiny wax explosions which often break down the thin margins of the investment, making it impossible to reproduce the wax pattern. The investment should be removed from the oven before the dark carbon residue entirely disappears in the crucible. This remaining carbon will not interfere with the casting, and if heated until this entirely disappears an irreparable injury will have been done to the investment, making it soft and powdery and many times causing sufficient shrinkage to crack the investment.

We endeavor to get our inlays out in 32 minutes after the first heating process is started, but it varies from 30 to 35 minutes, depending upon the heat and the amount of wax to be burned out. If the investment is heated even 30 seconds beyond that which is necessary to volatilize the wax an injury will have been done.

Most dentists will leave them on the fire anywhere from 10 minutes to 2 hours after the wax has disappeared, then wonder why the inlay does not fit.

COLD MOLD.

We should always cast into a cold mold. By this I mean a mold not above room temperature. A hot mold is a distorted mold, and a distorted mold means a misfit inlay.

CASTING MACHINE.

Your casting machine should be one which will deliver a definite uniform maintained pressure directly upon the gold until crystallization is complete. There is just one pressure that is right for casting inlays. Any more or any less is injurious.

GOLD.

Twenty-four carat gold should be used except where more strength is needed. For example, over a thin step on an incisor, then the gold may be alloyed with 3% platinum which will give the desired strength.

Pure gold will not hammer out of shape under the stress of mastication provided the occlusion is accurate, except on the incisors.

SCRAP GOLD.

It is a temptation to cast with your scrap gold, but this is a mistake, for you cannot judge when the gold is exactly at the right temperature for casting and the distortion when alloyed with base metal is much greater. The inlay is more difficult to seat because of the hardness of the mass and the margins are not easily burnished.

Pure gold will adapt itself to the cavity walls rather than rocking as would be the case with the harder alloyed golds.

When the occlusion is not accurate and the pure gold hammers under the stress of mastication it is better that it should do so than to continuously take this stress which sooner or later will either loosen the inlay or the tooth, or both.

FOIL FILLINGS.

Never use old foil filling for casting. This we know is pure gold but it is always permeated by oily substances from the mouth, which under heat produces a gummy residue of carbon.

BLOW PIPE.

No matter how good a blow pipe you may possess you cannot get sufficient heat out of illuminating gas or gasoline if you use a sufficient quantity of pure gold, a cold mold and a funnel-shaped crucible. Sufficient heat can be obtained from either nitrous oxid, oxy-acetylene or Prest-o-Lite.

Most dentists use the shallow flat crucible, alloyed gold and a hot investment, thinking that these conditions give them better results, and so they will if they are unable to get their gold sufficiently hot.

QUANTITY OF GOLD.

At least three pennyweights of gold should remain after the casting is made. This quantity presents a larger surface to the pressure and maintains the gold in the sprue in a fluid state until the inlay has crystallized.

HEATING.

The gold should be heated as quickly as possible so that the mold may be comparatively cold at the time of casting. One should be able to pick the ring up in the hand with comfort after casting a large inlay.

The gold should be heated to just below the boiling point. This can be determined almost to a degree. The gold is ready to cast when the halo about the surface is sufficient to obscure from your vision the definite surface of the gold.

EFFECT OF SHRINKAGE.

When a paper is presented on inlays the first question which usually arises is: "Can you control the shrinkage of the gold?" The shrinkage from crystalline state to room temperature cannot be prevented, and I would not prevent it if I could.

When pure gold is used we can control the first period of shrinkage, that due to the change of state, or from a liquid to a solid. The shrinkage due to the change of state does not affect the fit of the inlay, it appears to be an air bubble just under the sprue. If the sprue crystallizes before the inlay the shrinkage is always in evidence in the casting, as well as in the remaining nugget, but if the inlay crystallizes before the sprue and the pressure is maintained on the nugget the gold will flow down the sprue and fill the space which otherwise would have appeared as a depression. Thus we control the shrinkage due to the change of state.

GINGIVAL SHRINKAGE.

The question most frequently asked is: "Why does the gold do all its shrinking at the gingival?"

Gold has no selective function. It does not shrink any more at the gingival than it does any place else, but I will tell you some of the reasons why we so often see an open joint at this point.

- 1st. Failure to bevel the gingival margin.
- 2nd. Working the wax instead of using cast wax.
- 3rd. Use of soft wax which distorts and the inlay cannot be seated.
- 4th. Failure to hold the wax under pressure until cold when the wax pattern is taken.
- 5th. Distorting wax while removing from the cavity.
- 6th. Releasing the elasticity by allowing the wax pattern to stand too long before investing.
- 7th. Allowing the investment to set over night before burning out the wax which frequently causes the investment to crack, enlarging the inlay.
- 8th. Nodules or moss on the gold due to using poor investment, or improper manipulation of the investment.
- 9th. Investing warm, distorting the wax by releasing the elasticity.
- 10th. Casting into a hot mold. A hot mold is a distorted mold.
- 11th. Overheating the investment when burning out the wax.
- 12th. Using too much pressure in casting.
- 13th. Using alloyed gold.
- 14th. Mixing the cement too thick, making it impossible to force the excess from the center to the periphery.

15th. Using coarse cement which cannot be compressed to the same degree as a finely ground cement.

Taggart's process of casting is probably the greatest thing that ever came to dentistry. Every element of weakness advanced against the cast gold inlay can be traced to faulty technic. When this technic has been mastered by the profession there will be no opposition.

ORAL HYGIENE.*

BY FRANK G. BRUNER, PH. D., M. D., DIRECTOR OF SPECIAL SCHOOLS,
CHICAGO, ILL.

Chicago was pioneer in providing for the special educational facilities for practically all classes of exceptional children. It was in Chicago that the first day schools were established for the blind, for the deaf, the crippled children and the epileptics. Unsurprising, therefore, is the statement that Chicago is first in offering special instruction to children in the hygiene of the mouth and the care of the teeth. For this type of teaching the schools are indebted to Mrs. Edward G. Snodgrass on account of whose vision and through whose initiative oral hygiene teaching becomes a part of the school curriculum.

Believing that by instructing children to properly care for their teeth future dental troubles might be obviated, the health would be safeguarded and in consequence the mental alertness and school progress enhanced, at a meeting of the Board of Education on January 22, 1918, Mrs. Snodgrass offered a motion to the Board of Education which ordered that Oral Hygiene be made a part of the educational curriculum in the elementary schools. This motion was adopted and the Board of Education authorized the Superintendent of Schools to employ a teacher of Oral Hygiene in the public schools of the City of Chicago. Final arrangements were consummated for beginning this instruction on May 9 and Dr. A. P. Baur, who had been rendering such splendid service in the dental

*Prepared for the Annual Report of the Superintendent of Schools, Chicago.

division of the Department of Health's work in the schools, was selected to give this instruction.

Although instruction in dental hygiene constitutes a distinct innovation in public school teaching, inasmuch as dental surveys conducted in Chicago and elsewhere have revealed such deplorable mouth conditions on the part of school children and so large a fraction of children's teeth so badly decayed as to interfere seriously with their health and in consequence with their mental efficiency, it would seem obvious that it should be considered quite as legitimate a part of the curriculum of instruction in the schools as physiology and personal hygiene, which have long held a prominent place in all courses of study. Carious teeth with the tooth-aches incident thereto; the toxic matters generated in the tooth cavities and expelled into the intestinal tract, to be later absorbed into the general circulation; the stomach and intestinal disorders incident to incomplete mastication of food; all are factors which in no small measure operate to prevent satisfactory scholarship and to induce backwardness and school retardation on the part of children. Argument should, therefore, be unnecessary for anyone familiar with the teaching art to make it apparent that anything which acts to reduce backwardness in school work or to prevent mental dullness and stupidity is quite as positively an educational agency as direct instruction or any other of those various activities in the schools, which are employed to sharpen children's minds, encourage thinking and make for social adaptation.

Instruction in oral hygiene in schools still being in an experimental and unorganized state, it was thought best to proceed somewhat cautiously, feeling our way slowly, as it were, in order that the character of the teaching might be most fully adapted to the needs and interests of the children and at the same time not be beyond the comprehension of even the youngest child in the kindergarten and first grade. It was hoped too, to have it of such a character that it would appeal to the children's practical sense and be applied by them daily in their homes. Hence in addition to talks to the children, it was deemed wise to teach them the need for, and the use of, the toothbrush by personal demonstration. Indeed, it is surprising how few adults actually know how a toothbrush should be used to get the best results; how frequently the teeth should be brushed, and the best means of cleaning and preserving the teeth.

It would be clearly quite impossible for a single instructor to reach in an individual way all of the 350,000 children in our public elementary schools, and yet because this work was so novel and the results unpredictable, it seemed unwise to begin with a staff of teachers large enough to meet the needs of all the schools. The best plan clearly was to try out the work in a few selected schools, and broaden out from these, modifying the tentative initial program as experience with the teaching and further needs as determined from observation of the results of the instruction might indicate.

As a preliminary survey, ten schools in the lower north side of the city were selected for instruction. Dr. Baur worked with the children of each classroom as a unit, each group thus consisting of not to exceed forty or fifty children. By keeping the number dealt with small, it was believed the individual child could be most effectively reached and the particular lesson driven home more thoroughly.

The mode of procedure was about as follows: On the first visit to the rooms the children were given general instruction in oral hygiene. They were taught the names of the teeth, their structure, the cause of decay in teeth, the best way to keep the teeth sound, the measures to follow to prevent cavities, and the necessity for brushing the teeth frequently. A day or two later the children were again visited at which time they were given a quiz, to review and to fix the instruction given on the first visit. This was followed by a demonstration of how to properly use a toothbrush and by instruction of each child in its use, care being taken to see to it that all children used their brushes in such manner as to cleanse thoroughly all surfaces of the teeth.

The time and plans for the second visit were prearranged so that the children appeared at the school on that particular day provided with personal toothbrushes. In the event that they did not possess brushes they were informed where they might be purchased most cheaply. By making arrangements with local school stores and the nearby drug stores, it is possible to provide a reasonably good quality of brush to the children, with a small profit to the dealer, at from 5 cents to 10 cents each. A brush with fairly good bristles and wooden back can be had at five cents and with the same bristles, but with a bone back, at ten cents. Thus it transpired that before Dr. Baur had completed his instruction in a school almost every

child owned a toothbrush and had promised that he would use it regularly. Did the oral hygiene instruction accomplish nothing further than this, in my judgment it was quite sufficient to justify giving it.

After a lapse of three or four weeks, Dr. Baur visited each group of children a third time, when all previous instruction was reviewed and a check made on the extent to which the first directions were being followed by the children in their homes. The results of this checking up are extremely gratifying, as may be noted from the table which follows, giving the names of the schools visited, the number of children instructed in each, and per cent of children owning and using individual toothbrushes before the instruction was begun, and the per cent who were regularly using toothbrushes four weeks later.

School	Number of Children Interviewed	Percent Using Toothbrushes Before Instruction	Percent Using Toothbrushes 4 Weeks After Instruction
Schiller	729	55%	85%
Manierre	689	43%	90%
La Salle	639	74%	96%
Newberry	830	50%	97%
Jenner	1,083	32%	87%
Franklin	893	52%	87%
Sexton, J. A.	469	71%	91%
Adams	840	31%	76%
Ogden	640	68%	97%
Mulligan	587	63%	88%
	<hr/> 7,399	<hr/> 51%	<hr/> 90%

Of the 7,399 children interviewed only 51% had been using toothbrushes at all. Some of these had been using them only intermittently and in many instances one family toothbrush sufficed for parents and children alike. Four weeks later 90% of these children said they were using their individual toothbrushes regularly. The most striking thing too about these results is that in schools like the Jenner, Adams and Manierre, where only about one-third of the children had been using toothbrushes and the teeth as a result were badly decayed, three-fourths to practically all in one of

the schools had acquired the toothbrush habit and were brushing their teeth regularly.

In addition to the instruction given to the children, Dr. Baur's program included directions to the teachers of the schools. The teachers of each school were assembled for an hour or hour and one-half, and given an outline of the best methods to pursue in teaching the children, so as to insure the most healthy possible condition of their teeth. In this way in the schools where instruction was given, teachers were made thoroughly competent to continue the work in oral hygiene and can be relied upon to carry on energetically a program of teeth conservation.

THE ADMINISTRATION OF THE ILLINOIS DENTAL LAW.*

BY FRANCIS W. SHEPARDSON, DIRECTOR OF REGISTRATION AND
EDUCATION, SPRINGFIELD, ILL.

A few days ago a gentleman in Chicago placed before Governor Lowden the case of a dentist in this city. He is a man of foreign birth who has been enjoying life here in America and has been practicing his profession under conditions of peace and prosperity. He left his own country to avoid the responsibilities of citizenship demanded under the form of government there prevailing. When our country became involved in the world war and asked from each one of its sons the supreme sacrifice, if need be, this dentist refused to register for military service. Instead he proclaimed himself an alien enemy. The Chicago citizen who reported the case raised a question whether the license of such a man should not be revoked. He denounced the cowardly slacker who was unwilling to fight for the land of his birth and equally unwilling to serve the land of his adoption. He felt that such an individual should not be permitted the professional privileges which come through the possession of a license to practice dentistry, which privileges carry with them the possibility of securing shelter, sustenance and perhaps competence.

When the case was referred by the Governor to the Depart-

*Read before the Chicago Dental Society, Tuesday, September 24, 1918.

ment of Registration and Education it was soon seen that the Dental Practice Act had no provision covering it, for this law uses the word "person" rather than "citizen." Perhaps this is the proper word. The presence of war conditions sometimes warps the judgment. No doubt in the long run it is more in accord with American traditions to grant privileges to any one who seeks refuge here whether he become citizen or remain alien. International treaties now in existence provide that aliens in America shall be granted the same privileges as Americans in foreign lands. It is at least interesting to note that some residents of the State question the propriety of permitting the retention of a dentist's license by an individual of the slacker class.

Another case recently called to the attention of the Department is that of a Chicago dentist who secured considerable practice in a certain locality. He undertook a number of pieces of work for which he demanded and secured payment in advance. After only partially fulfilling his obligations in the premises he moved to another and distant part of the city. There he was discovered by his former patients who, however, were too far away geographically to make it convenient for them to visit the office in the new locality. Question was raised whether the license of this man should not be revoked. The law mentions as subject to discipline an individual who has "obtained or sought to obtain money or practice or any other thing of value by false or fraudulent representation." This provision could hardly be invoked in the instance mentioned, since the dentist, no doubt, would state that he accepted the money in good faith and had every intention of doing the work, and perhaps, such declaration might be true.

At the time of the recent meeting in Chicago of the National Dental Association, there was shown an advertisement of a dentist residing in one of the suburbs. This advertisement, which was in the form of a notice in the local news column, stated that the dentist would be absent from his office from Monday to Thursday, as he would be in attendance at the National Dental Association meetings at the Congress Hotel. He had also been honored, so the notice read, with a place on the program, being called upon to give several clinics in painless extraction. The one who showed me this notice said that the particular dentist was a notorious faker who did not belong to any of the organizations, whose membership is essential

to membership in the national body and to attendance upon its meetings; furthermore, that there were no such clinics in the program of the meeting; and that all the man in question could do at the meeting was to look at the exhibits. Here was a clear case of fraud whereby a dentist sought to gain practice by giving an impression to the residents of his suburb that he was recognized nationally in his profession. The Dental Law probably has no provision for the proper punishment of such a practitioner.

Many communications, written and oral, have been received by the Department regarding that type of dentist represented by the flamboyant advertiser, the one who likes to cover his windows with alluring signs, or to proclaim his distinction through lengthy advertisements in newspapers, and whose name may be represented on occasion by any number of individuals who work at a given location. The Dental Practice Act does provide that one who practices under a name other than his own may have his license revoked, but the difficulties of securing proof in such cases are so many that the provision is practically a nullity. Where specific complaint has been made, prompt investigation has followed. In one instance an establishment advertised under some such title as "the laboring people's dental parlors" was visited. The dentist had in his employ an unlicensed man who had three names used interchangeably. A fire escape in the rear of the office afforded means for a quick getaway if needed. A former helper stated that it was used often. Fines were secured in this case. In some other offices there were suspicious conditions leading to the conviction that students who were employed at night used the licenses of the men on the day shift. But in the main no sufficient evidences of law violations were found in offices of this type.

The Department was asked to take action regarding a dentist who spread strychnin about a building in which thirty-two families lived, stating that he had done it because the cats in the neighborhood annoyed his wife. The poison was placed about on fish, canned salmon, and other articles, and, as a result, a valuable Airedale terrier dog was poisoned. For this the dentist was arrested but was discharged by the judge with a sharp reprimand. Such a matter as this, of course, does not come within the regulating power of the Department, improper as every one naturally would concede such thoughtlessness on the part of a dentist might be. Other com-

plaints of this nature, judged clearly outside the jurisdiction of this Department, no matter what opinion there might be regarding the professional or personal propriety of such things, are the following: A charge made by a woman that her beauty of person had been destroyed through poor dental workmanship; or, by another, that her tongue had been injured by being punctured through the careless handling of a drill by a dentist; or by a third, that her dentist husband had beaten her and had neglected to support her properly.

If time permitted more illustrations might be given to show the need of careful revisionary study of the statute of Illinois regulating dentistry. In its principal provisions this was in force July 1, 1909. Some amendments were made to it in July 1, 1915. Even a casual examination of this law shows the great need of change. It has nineteen paragraphs nearly every one of which needs to be modified, certainly as to its language and possibly as to its content, for this law refers throughout to what is called "The Illinois State Board of Dental Examiners." This Board passed out of existence on June 30, 1917. On July 1, 1917, the Civil Administrative Code became operative. Under this Code the rights, powers and duties vested by law in the Board of Dental Examiners passed to the Department of Registration and Education.

While some members of this organization may have familiarized themselves with the general plan of the Code and with the work of the Department, it may not be out of place at this time to consider these briefly:

Illinois is still administered under a Constitution nearly half a century old. Since it was adopted in 1870 this, then relatively small, city by the lake side, was twice destroyed by fire, was reborn with a giant's aspirations, and has become one of the metropolitan centers of the world. The marvelous development of the uses of electricity as represented by arc and incandescent lights, by telephone, by trolley and by wireless telegraphy, the automobile, the fast mails, the typewriter, and most of the prized conveniences of modern life have come to people who live in steamheated houses, use steel construction skyscrapers for business, enjoy the dictograph and the phonograph, and find pleasure in moving pictures. None of these were known when that Constitution was adopted.

Thus mere listing suggests the astonishing changes in country

and commonwealth during this half century of tremendous growth. These changes led from time to time to the creation in Illinois of special boards and commissions, designed primarily to relieve overburdened constitutional officers from tasks which it was physically impossible for them to perform. In practical experience these boards and commissions, eventually more than one hundred and thirty in number, tended to become semi-independent administrative factors in government, each with its own headquarters, officers and equipment. Almost inevitably conflicts of jurisdiction resulted and with them, naturally, much duplication of effort and expenditure.

A few years ago the General Assembly appointed a commission consisting of four senators and four representatives who were among the ablest members of the legislature. They were authorized to make an investigation of all departments of the State government, including all boards, bureaus and commissions which had been created by the General Assembly, with a view to provide a more perfect system of accounting and to combine and centralize duties. It was hoped that this study would lead to the rejection of much useless machinery and to a reorganization of the State government, with the aim of greater efficiency and economy in administration. The advice of a large number of officials and citizens was taken, after many hearings at which testimony was presented from almost every possible point of view. As a result of the committee's investigations, there was published a report of 1,050 pages, generally recognized as one of the most remarkable documents in the history of State government in this country.

The gubernatorial campaign of 1916 was made the occasion for placing the Code project before the people for general consideration and discussion. Colonel Frank O. Lowden made its championship one of the prominent planks in his platform. Immediately after the people had chosen him to the high position of Governor, he took active measures to make the idea a reality. In his inaugural address he emphasized the importance of the administrative reform. He secured the co-operation of many members of the legislature. He devoted long hours of study to the problem. Largely because of his earnest advocacy, the Civil Administrative Code became law. For it, as well as for his patriotism and loyalty as a great war governor, his administration will always be praised. (Applause.)

Its salient feature, as has been stated, is the centralization of

the various governmental agencies, with the exception of the Civil Service Commission and certain temporary boards, into the nine departments of Finance, Agriculture, Labor, Mines and Minerals, Public Works and Buildings, Public Welfare, Public Health, Trade and Commerce and of Registration and Education. For each of these departments there is an executive officer called a Director who must devote his entire time to the State work. He is provided with such subordinate assistants as are deemed necessary, the number varying in the different departments.

The Code has now been in operation for fourteen months. The experience has amply justified those who so strongly urged the administrative reform. Its machinery has worked far more smoothly than its most sanguine supporters had hoped. Naturally, some difficulties have presented themselves. The period of operation is as yet too short to warrant final judgment. Deficits from previous years had to be paid this year and imperative expenditures for long-needed repairs and improvements had to be met. The extraordinary circumstances of the past year of war, such as the rise in the cost of commodities, the exceptional coal bills due to the severe winter, and the increase in postage and in railroad rates, have made havoc of plans for economies. But all who are actively associated in the administration confidently believe that, if given a chance for a fair trial under normal conditions, the Code will prove its great value by substantial financial savings as well as by increased efficiency. The Department of Finance is the keystone of the structure. Its work is certain to show gratifying results. Its officers are giving the most painstaking scrutiny to all outlays, and many kinds of waste heretofore ignored are being effectively checked. They are studying the expenditures of every part of the State government with the purpose of preparing a detailed budget under which the State's business in coming years may be conducted in a systematic manner and with the same economy and fidelity demanded in all successful private or corporate undertakings.

The Code is a remarkable State document. It represents a notable advance in political science. The plan of organization of each department is extremely interesting. The distribution of powers among the departments; the internal workings of the departments, and the great variety of the problems requiring administrative solution are alike attractive. Its scope may be widened by subsequent

legislation to include other departments without affecting the general plan. The widespread interest awakened in it throughout the country and the report that several other states are now giving serious consideration to the adoption of a similar plan of government, are suggestive of what is in store for one who will study carefully the thirty-seven pages of this epoch-making legislative act.

The special topic of present discussion is the administration of the Dental Practice Act of Illinois. In the reorganization scheme the licensure of dentists, formerly in charge of the State Board of Dental Examiners, was placed in the Department of Registration and Education. Something about this Department, therefore, may be of interest.

While the double name, registration and education, seems to imply divided activity, a closer survey of the powers and duties of the Department shows that the thought of education is the dominant one. The word "registration" relates to the administrative work associated with all those professions and trades of whose members the State requires a license. The Department has jurisdiction over about a dozen different lines of endeavor, including those of the architects, barbers, chiropodists, dentists, embalmers, horse-shoers, midwives, nurses, pharmacists, physicians, plumbers, structural engineers and veterinarians. It has a staff of twenty-seven persons whose work is being so organized as to distribute responsibility most effectively and to secure accuracy, efficiency and promptness in administration.

The oversight of the licensing features of the activities of the Department is placed in the hands of an official called the Superintendent of Registration. He is in a measure the united secretary of the component former State Boards. He is charged with arranging for the necessary examinations as provided for in the statutes, with furnishing of adequate assistance for the examinations, with the notification of the successful candidates, with the keeping of the records and files of certification, and with the large amount of correspondence relating to licensure in the several lines. Inasmuch as all the laws which regulate licensure provide for the evaluation of credentials both of preliminary education and of professional training, the division of registration has among its duties the collection of the essential preliminary information about applicants and the investigation of their qualifications for examination.

So, naturally, the Department must concern itself with the establishment of standards and the approval of both the schools themselves and their courses of instruction. If the authority given by the Code and by the several practice acts should be invoked to its full degree, it would be seen that the power of the Department over schools of all grades and types is very great. The word "education" in the Department's title, therefore, does not imply an entire change of thought from that of "registration." It may, however, be taken to refer to certain types of higher education which are carried on under State auspices, and which are professional, investigational, or strictly scientific in their nature. The five normal schools which heretofore have been controlled by separate boards of trustees, are now placed under the jurisdiction of the Department, with a single board of which the Director of Registration and Education is chairman. Grouped under the Department, also, are the scientific surveys, located at Urbana, in connection with the State university, namely, the State Geological Survey, the State Water Survey and the State Natural History Survey. For the study of the needs of these surveys and the development of their work, a special advisory board of scientists, called "The Board of Natural Resources and Conservation" and representing the different fields of research touched by the surveys, has been provided, the Director of the Department being its chairman. The Department has jurisdiction also over the State Museum, located at Springfield. For advice regarding its management there is a board composed of specialists representing the five different lines of activity with which the museum concerns itself, namely, botany, ethnology, zoology, manufacture, and museum administration.

The Code specifically provides that the Director of Registration and Education, the Assistant Director, and the Superintendent of Registration shall not be affiliated with any college or school of medicine, pharmacy, dentistry, nursing, optometry, embalming, barbering, veterinary medicine and surgery, architecture or structural engineering, either as a teacher, officer or stockholder nor shall they hold license or certificate to exercise or practice any of the professions, trades or occupations regulated.

The reason for this restriction is apparent. Absolute impartiality and exact justice are more likely to be secured where personal interest or possible professional jealousy are absent. In the work-

ing out of the Code plan there has been marked a notable change of attitude toward the law on the part of both chance and intentional violators. The prospect of being prosecuted by a great Department of State government, the executive officers of which are not members of the profession involved and whose main interest in the case is that of the enforcement of the law of the State, appears to be much more feared than was the danger of trouble with the members of a board connected with the same profession. This has had many illustrations since last July. There is no doubt that every practice act of Illinois has become far more effective than it ever has been, because it now has behind it the machinery, the resources and the administrative power of a State department.

Another restriction of the Code provides that where the law of a profession, trade or occupation so requires, none of certain enumerated functions and duties shall be exercised by the Department except upon the action and report in writing of persons designated from time to time by the Director to take such action and to make such report. For the dentists a committee is provided of five, each of whom has been a licensed practitioner of dentistry or dental surgery in the State of Illinois for a period of five years or more, and no one of whom is in any way connected with or interested in any dental college or dental department of any institution of learning. This committee is composed of Dr. Thomas A. Broadbent and Dr. H. J. Tharp, of Chicago; Dr. James R. Welch of Peoria; Dr. E. F. Hazell, of Springfield, and Dr. F. B. Olwin, of Robinson.

Under its direction two examinations for licensure have been held, as provided for by law, one in November, 1917, and one in June of this year. Three hundred and eighty-nine candidates altogether presented themselves of whom 362 were successful and 27 failed. According to the records there are now 5,333 legal practitioners of dentistry registered with the Department.

With greater power because of the Civil Administrative Code, and with a department well-organized and ready to act, it will be worth while now to consider in more detail whether increased efficiency might be secured through a revised and strengthened Dental Practice Act. As has already been indicated, the wording of this statute needs much alteration in order to adapt it to the changed conditions of administration. If verbal changes are to be made, it might be wise to use the opportunity to perfect the Act in as

many of its features as possible. A few suggestions for consideration are hazarded.

In recent months the Department has been carrying on a vigorous campaign against the illegal, improper and unethical practitioners in a number of occupations, trades and professions. It has received the hearty co-operation of the best elements interested. It has been enabled to gain the support of the courts in its prosecutions. It has revoked a number of licenses. It has accomplished much in helpful and healthful lines.

Little, however, has been done in dentistry. From July 1, 1917, to date the Department has filed in the courts thirty-four cases against dentists. Of these twelve have been settled on payment of fines aggregating \$570, fourteen on payment of renewal fee of \$20, and six are still pending, judgment being withheld in two. There is not much in the Practice Act giving corrective or punitive power. The paragraphs which contain references to the supreme penalty, the revocation of license, provide that this may be brought about under the following conditions:

1. Where an individual, by false or fraudulent representations, has obtained or sought to obtain practice in his profession.
2. Where an individual, by false or fraudulent representations, has obtained or sought to obtain money or any other thing of value.
3. Where an individual has practiced under a name other than his own.
4. Where an individual has failed, within ninety days from the date of issuing his license, to register such license with the county clerk of some county of the State.
5. Where an individual has been guilty of "any other dishonorable conduct."

The last provision is one under which it is generally considered quite difficult to secure conviction. Opinions differ so widely as to what actually constitutes dishonorable conduct that experience suggests that this reason has value more as a supplement to some other one than as a sufficient ground in itself for so drastic a step as that of the revocation of a practitioner's license. Eliminating also the purely routine provision connected with the recording of a license, but three causes for revocation remain, two of them being essentially similar. It is worth while to consider whether there may not be other sufficient grounds for determining that a given individual is

unworthy to practice this high calling in Illinois. The revelations connected with investigations in other lines of inquiry suggest that there may be individuals practicing dentistry who should be debarred from it. The complaints, some of which have been mentioned, convey the same impression. The observation, even of laymen, is that there are dental offices which bear all the marks of quackery and fraud. The subject is one which seems well worth careful consideration.

The provisions in the present law regarding the form of license are not clear. The act appears to call for two certificates. One is a license, which, however, seems to be valueless anywhere, whether at home or abroad, after November 1, of the odd-numbered year following the date of its issue, unless it is accompanied by a certificate of registration, which certificate is stated to be *prima facie* evidence of the right of the holder to practice dentistry, or, to use a common phrase, shows that he is "in good standing." The previous board apparently sought to remedy this defect by requiring the renewal fee right from the start of the professional career of the successful candidate for licensure. He was charged an extra dollar at the time of payment for his license, in order to make that license effective. The Department attempted to solve the problem in another manner, namely, by the issuance of a single certificate which would answer the double purpose of license and of *prima facie* evidence that the license was good. It first sought an opinion from the Attorney General, whether the proposed certificate would meet the provisions of the law. This opinion being given in writing and declaring that the single certificate would suffice, the Department proceeded accordingly. Its action brought considerable criticism from different sources and led to some friction. Some individuals wanted a license *per se*, although, under the Illinois Dental Act, such license is valueless unless accompanied by a certificate of registration, so far as this State is concerned; and is valueless anywhere else, since no other state will issue a license to a dentist from Illinois, unless he is "in good standing" at home. Some objected to the form of the certificate, declaring it exactly like that issued to the horse-shoer, the embalmer, or the chiropodist. They might have added, also the physician, the pharmacist, the plumber, the registered nurse, the midwife, the architect and the structural engineer. For Illinois, slowly indeed, has taken up the idea of uniformity of certificates,

long popular in other commonwealths, and strictly in harmony with the idea of the Civil Administrative Code. Some lamented the passing of the ornamental border with which former certificates were embellished. Some complained bitterly that a new frame was required, because the new certificate would not fit the old one. Some even went so far as to get another opinion from the Attorney General, contradicting the one rendered to the Department. All this discussion, of course, showed the need of revision here.

The value of the renewal provision is increasingly apparent. It enables the Department to keep in touch with legal practitioners. It is a great aid in keeping a correct roster of addresses. It affords opportunity to discover cases of individuals using the licenses of others who have died or have left the State or from whom certificates may have been stolen. It enables the Department better to control some of those unethical practitioners whose actions bring discredit upon the profession. It furnishes funds for the Department at slight cost to the individual dentist and most of the expenses of the Department are met from the fees paid under the several licensing laws. The willing payment of the small fee provides a splendid argument against the imposition of a larger one, easily possible in these days of regulation, when governments are seeking everywhere for increased opportunities for raising needed funds. It is strictly in line with the best practice elsewhere. Some of the professions which have not availed themselves of its advantages, as for example, that of medicine, are now planning its adoption. It is worth thought whether the renewal should not be annually rather than biennially, and whether the fee of fifty cents a year is suited to the dignity of the dental profession. It should be at least a dollar. The structural engineers and the master plumbers pay ten dollars; the architects, five dollars; the chiropodists, two dollars; the registered pharmacists, a dollar and a half; the barbers, embalmers, horseshoers, assistant pharmacists and journeymen plumbers, one dollar. The larger the amount received by the Department in such fees, the more efficient its work would become because better manned.

Question has been raised regarding the fine for violation of the law, in addition to the restoration fee, in a case where a license has lapsed because of failure to pay the registration fee for renewal. The law requires a restoration fee of twenty dollars, and also provides a fine of from fifty to two hundred dollars for illegal prac-

tice. In its determination to enforce all the laws placed in its charge, the Department had its inspectors make inquiries regarding dentists. Many violators were discovered some of whom had been enjoying the benefits of practice in this State for long years without paying the fees provided for by law and paid properly and promptly by the great majority of the profession. When they were arrested, as the law contemplates that they should be, influence of all sorts, political and professional, was brought to bear upon the Department in their behalf. The officials of the Department were charged with persecution of "good fellows," and even some of the individuals to whom they had a right to look for hearty support in the enforcement of the law joined in the pleas for abatement of the penalties. Incidentally it was discovered that there were quite a number of practitioners who claimed never to have known of the registration feature of the law. If the double penalty of restoration fee and fine is too severe, the law on this point should be modified.

The steady advance made of late in the direction of improved schools of dentistry, and the recent survey, rating and classification of such institutions by a national committee raise the question whether a revised dental law should not contain much more specific provision regarding fitness for licensure as evidenced by preliminary and professional education and also regarding the endowment, equipment, curricula, administrative rules and teaching force of dental schools. There should be a requirement of an entrance qualifying certificate issued by the Department on presentation of proper high school credentials or after examination to determine equivalent held under its auspices. A definite minimum standard for schools should be indicated and the Department of Registration and Education given power to establish additional requirements if deemed desirable. The new Medical Practice Act might give helpful hints in this matter.

In the matter of reciprocity a question has arisen regarding the indication of five years of practice as a prerequisite to licensure, the suggestion being made that one or two years would be sufficient. The bar of five years might work a serious hardship to some Illinois dentist on occasion. It also is questioned whether the law should absolutely prohibit the extension of the reciprocity principle of licensure to those from states not in reciprocal agreement with Illinois. There are states which do not reciprocate at all. Should

there not be freedom for individual adjustment under proper conditions?

Other topics might be considered if time permitted. But what have been discussed are sufficient to indicate the variety of problems which have been presented to the Department for reflection, for interpretation and for solution. The Department desires the strong support of the best elements of the dental profession in the State, represented in organizations like the Chicago Dental Society. Its ambition is to help in every possible way toward the upbuilding of the profession. Its purpose is to enforce the law regarding dentistry as strictly as it may. Its aim is to make the requirements for licensure more rigid, so as to eliminate the unfit; to demand more careful attention of college officials to the records of student work; to scrutinize with greater pains credentials of preliminary preparation; to guard the entrance to practice by selecting examining committeemen of the highest character and of unsullied integrity. It looks forward in the near future to the completion of lists of approved schools of various grades from the public school, through the colleges and the professional schools. It will have for the aid of the dental profession the benefits of inquiries now being made in connection with other professions whose laws it likewise is called upon to administer. The worth of this larger fund of knowledge illustrates the value of the Department under the Administrative Code as compared with previously existing boards, whose work was limited to a smaller field. Thus they hope better to protect the individual who spends his money for professional training, and more important yet, to protect the people against the impositions of unworthy and unskilled practitioners. These ambitions attained, it goes without saying that the dental profession in Illinois will be placed upon a higher plane of honor than ever.

As Director of the Department of Registration and Education, I seek the hearty co-operation of Chicago dentists. The Department will not be satisfied until the requirements for dentistry in Illinois are as high as in any other part of the country. If by united action against those who discredit the profession, by the enactment and support of an approximately ideal law, by the encouragement of high grade dental colleges, and by the initiative of our leaders in advance movements we could turn the eyes of all toward Illinois as the State of progress in all dental matters, it would be cause for intense and honorable pride.

CHICAGO DENTAL SOCIETY, SEPTEMBER 17, 1918.

DISCUSSION OF PROFESSOR SHEPARDSON'S PAPER "THE REGULATION OF
THE PRACTICE OF DENTISTRY IN ILLINOIS."

DR. T. A. BROADBENT:

I realize that I am wholly inadequate to express the appreciation that I have personally for this magnificent paper. I wish to congratulate the Society on being able to obtain a man to present this subject in such a clear and understandable way. The majority of the dental profession are not familiar with the dental practice act and this paper will enlighten us. In the past years I have given some attention to this subject and I presume that is why I have been asked to open the discussion. I have learned much from this paper and I am sorry that I did not get it sooner, so that I might have written a brief discussion.

I was much interested in some of the instances that were related in the paper regarding certain institutions in Chicago, especially the one Professor Shepardson mentioned. I had an experience with that fire escape when I was on the board. In one case I was fortunate enough to catch the man before he went down the fire escape, and we secured a fine for him and the man who ran the place. We had employed an investigator during an examination held here in Chicago. This man was attempting to find this same kind of a man that Dr. Shepardson describes, who used numerous names interchangeably. Our investigator was watching this office from an alley between Dearborn and State Streets trying to get hold of the patients as they came out of the office. He was afraid to go up in the office and get the man. I had employed this man and the board was anxious to get some report. Finally, I said I would go up and get the men in the dental office. I went up and got them. They threatened to throw me out at first. The investigator had said to me, "You had better not take any chances. They are apt to throw you out of the window," but there was no trouble at all.

I would like to cite another instance of quackery in Chicago. Just about two weeks ago a man whom I have known for 30 years as a practicing dentist came to my office and said he was going to Michigan. He had given up practice and had been employed in a

dental parlor and wanted to get the benefit of reciprocity with Michigan. I said, "No, we cannot recommend you." He said, "Why?" I said, "Why are you leaving—is business bad?" He said, "No, business is good." I said, "Then why are you going away?" This was his reply: "I will go to hell for a man, but I will not go to jail for him." This gives some idea of what was expected of him as manager of this dental parlor.

I know that the present dental examining committee is more than satisfied and gratified with the management of the dental profession by the department at Springfield. At first there was some little friction, but it was because we did not understand each other and after we found out where our authority stopped in each case and the other began, we had no trouble. I had the honor of serving on the old board and I was secretary for a number of years, and this new law is a great improvement over the old state board system. A man who was really qualified did not care to be secretary of the State Board of Dental Examiners for the simple reason that the state would not pay sufficient salary to warrant his giving time to it that was absolutely necessary for him to give. In other words, he was serving at an actual loss and in my experience it cost me one thousand dollars a year or more for every year I was secretary through loss of practice. I know this because my practice has increased since I gave up that position, or since Governor Dunne took it away from me. I have had the honor of serving under the old system and in the new and I can see great improvement in the new. For instance, in the last examination when we examined something over 330 candidates, we would certainly have been very much at sea if we had not had the assistance of this department. The examination was posted to begin at 8 a. m. All the committee had to do was to get down at that hour. Everything was in readiness. The questions were there. They had been sent to Springfield to be printed. The material was there and distributed. The men were given the numbers they were to put on the papers. They simply filed into their places and the examination was under way at 8 o'clock. Under the old system we would have had to consume a whole day before we could have started on the examination. The preliminary credentials had been examined in advance. The diplomas were the only thing to be examined and we did this in the course of the examination. While we had a class of 330, we completed the

examinations in a half day less than we had ever been able to do before with a class of even 50, and the same was true with the practical work. It requires a great deal of study and experience to know how to handle such a body of men and do it with rapidity. This new system is certainly a great improvement and I am sure that the dental profession will give the department the aid and assistance that Dr. Shepardson asks for and we can do that by giving information wherever it comes within our knowledge. He is anxious to clean up the profession.

Also the matter of dental schools—under the old system the board was supposed to supervise the schools, and to see that the preliminary credentials were up to grade, but with the new system the department has now they can do that much more thoroughly and satisfactorily and with just as much satisfaction to the schools as it is to the committee.

In regard to the matter of reciprocity, I have been working along that line for a number of years. When I was elected secretary of the board some eight or nine years ago we had no reciprocity. When I severed my connection with the board five years ago we had about 11 states that we had reciprocity with and now we have 14. I think before many years if things are allowed to remain as they are, if some other reform is not brought in, we will have reciprocity with all the states in the union. With the committee working in harmony with the department I am sure we can bring about this condition.

There is one point in Dr. Shepardson's paper that I would like to explain, perhaps to him as well as to you, that is, the five-year clause in the reciprocity contract. If a man in Illinois wishes to leave the state he must have practiced here five consecutive years just prior to his application for license in another state. The reason for that was to keep men from floating about, practicing in one state a year and then moving somewhere else. He must remain in one state at least five years. Otherwise, if he wishes to move he would have to take the full examination. Another thought was, that men who had not been out of school more than five years should be able to pass the theoretical examination. After that time it takes more or less study to pass the examination, because as a professor on education once said, "the farther we get away from school the less we know," which is true in the great majority of cases. We do

not keep posted on theoretical subjects unless we are teaching or have occasion to use them daily.

There are many other points in the paper that I would like to mention, but I know Dr. Dittmar has a message for you that will be interesting. There is one thing I want to mention, that is regarding the amendment of the dental act. That should, of course, be taken up by the legislative committee of the State Society, of which Dr. Dittmar is a member. I think with the co-operation of the department and the dental profession there will be no difficulty in passing the bill and I hope it will be so amended that these quack institutions can be reached. Under the present law it is impossible to do anything. In order to pass the law we must educate the public and the press up to the point where they will support the dental profession. In the past it has been practically impossible to legislate against these places because the newspapers want their advertising. Another thing, in any law we might have passed we must have the support of the bench. The judges are not in sympathy with a great many statutes on our books. I might cite an experience I had when I was on the old dental board.

I had a man before a judge of the municipal court, who is now running for county judge at the coming election. I had the young man arrested for practicing without a license and, of course, we only got evidence of about two cases. That is sufficient to convict as a rule. When the young man saw we had the goods, he came in and pleaded guilty. The judge said, "What is the minimum fine in this case?" He was told it was fifty dollars. He said, "Why should I fine this man fifty dollars for filling a few teeth? Why, if he had been in a street fight and knocked out a few teeth I might fine him five dollars and costs. The case is dismissed." I said to him, "What is the use of having statutes on the books if they are not enforced?" He said, "Half the statutes are not enforced," and pointing to his lower molars, which were crowned with cartridges—gold crowns, he continued, "The man who put those on for me did not have a license." That is the kind of a man we elected to judgeship. (Applause.) It is pretty hard to get judgment in a case of that kind.

I wish, Mr. President, to personally thank Dr. Shepardson for this paper and I will give way to Dr. Dittmar. (Applause.)

DR. G. WALTER DITTMAR:

I desire to offer the same excuse as did Dr. Broadbent. Un-

fortunately, I am not prepared to discuss this very excellent essay in a manner I would like for the reason that I did not get the paper in time to carefully read it. It was first sent to Dr. Gallie, who was to discuss it. I am sorry that Dr. Gallie is not here to make this discussion because I am sure he would discuss it very much better than I can.

The paper was so clear in its statements and so well delivered that, as Dr. Broadbent says, there is very little open for discussion. There are a few points that I might mention and endeavor to discuss to some extent—a few points that possibly you are, or may be, interested in. The one thought that I had while Mr. Shepardson was reading his paper, the central thought in the paper, is that our dental law needs revision. We are certainly all satisfied that that is a fact from the evidence presented here tonight and from the evidence which we had before. There is no question but what the dental law needs revision. I want to say as a member of the Legislative Committee of the Illinois State Dental Society, that I have met with that committee numerous times and that committee has endeavored in past years to revise the dental law. It is not an easy thing to have a law passed. Before the last legislature our committee proposed a number of changes which the State Board of Dental Examiners—Special Committeeman Dr. Geo. N. West and the Legislative Committee believed were badly needed and which in the main would harmonize with those points that Mr. Shepardson suggested here tonight, but they were not passed. It is not an easy thing to pass a proposed law. The support of the dental profession is needed and more than that. The legislators are quite suspicious of the professions. They think that the professions propose laws for their special benefit. The legislators are representing the people. The laws are primarily made for the people and they look out that the laws are so framed that the people are not going to be imposed upon. However, if they can be convinced that the proposed law is for the benefit of the people first and secondarily for the profession, they will support it, that is the honest men will. I will say we made an honest effort at least to have the law amended but in the last hours of the legislature our bill was lost. It would seem from what Mr. Shepardson has said that it might be best just “to forget the present dental law and appoint a committee or get some agency” at work to draft an entirely new dental law and in-

corporate in it the things that we want and the things that the people want, making it strong enough for the people, then the legislature will, no doubt, pass it.

Now there are two or three points more that might be commented on. The thing that probably interests you more than anything else that I might talk about and one that has been of interest to me in the past is the clause in the law which has reference to the biennial registration, the payment of a dollar fee and the payment of a twenty-dollar fine in case you do not register within a limited time, and a further fine because you have been practicing illegally because your license had expired. I was on the Legislative Committee when this particular clause was inserted and I know a little of the history of "the why" that was inserted. At that particular time, as Dr. Broadbent has just said, the state dental board was short of funds. It needed funds for the prosecuting of the various cases of illegal practitioners, which were in the city of Chicago and other cities. It was found also that there were no reliable records of the number of dentists in the state who were licensed. Some were dead, some were practicing under licenses that had been procured years before by men who were out of practice or dead. There was a rather chaotic state of affairs. Therefore, the idea of making every dentist register was introduced so that we might be able to find out just how many dentists we had in the state and where they were located. Furthermore, we wanted additional funds to prosecute those men who were illegally practicing. The legislature could see nothing wrong in what we asked for and consequently passed that clause to be added to the law. Then we obtained plenty of money to prosecute illegal practitioners. Sometimes we did not accomplish much, but the point remains that this particular clause was in the law, which at that time, in my judgment, was badly needed. A few years after the Legislature in one respect at least put our scheme to grief it proposed that all moneys which were collected by boards of every description, dental boards, medical boards, etc., should be turned into the State Treasury and all expenses which those boards incurred in conducting the business of their offices during the year must be drawn out of the state treasury, and that the board must show the amount that was necessary before they would be allowed to draw it out. In other words, they must prepare a budget and show just what the expense would be and then they

would be allowed so much money to conduct their business. The fact was that the dental profession turned into the treasury of the state thousands and thousands of dollars out of which it got no direct benefit. By the way, I do not blame the gentlemen who sent the letter to Mr. Shepardson regarding "that last dollar."

DR. SHEPARDSON:

He was not a dentist.

DR. DITTMAR:

I would not be surprised if he was. There is a reason for the kick and the reason is that the dental profession does not at the present time get any good directly out of the money it pays into the state treasury in this tax, that is, the state gets thousands of dollars to be used for other purposes. The question is, why should we tax ourselves as a profession to take care of prisoners in Joliet or something just as ridiculous? It is a question whether we want to put in a new law this particular paragraph that we should pay an annual fee of one dollar. Now, Mr. Shepardson spoke of the various occupations and professions paying an annual registration fee of anywhere from a dollar to ten dollars. If I am correctly informed as to the channel in which this money goes, I cannot see the justice of taxing the occupations and professions in that manner. Maybe the channel is not the one I think it is. It may be further that the state will legislate that all professions will pay taxes. They may enact a law that will apply universally. It may be that we will have to pay one dollar or five dollars, but whether the dental profession wants to legislate itself into paying taxes out of which they do not get any benefit directly is a question. The regular taxes of the people generally should support the department of registration and education the same as it supports every other state department, that is, for the benefit of the people generally.

I do not know that there is anything further that I want to say, with the exception, I am gratified as I am certain we all are at what the department of registration and education has done. I have been with the Legislative Committee in conference with Mr. Shepardson a number of times on legislative committee work and I know that Mr. Shepardson is an official of a very high type. He is honest and sincere. He is trying to do the very best for all professions and I believe that all the professions appreciate the efforts which he has made and is making. I know he was very, very careful before

he selected the present dental committee. I know that he is endeavoring to work for the benefit of our profession, and as long as the department has as its head Mr. Shepardson or a man of his equal, educational matters in our state will be safeguarded.

There is, however, this one great weakness: The head of this most important department is appointed by the governor. Governor Lowden chose carefully and wisely. No doubt every governor tries to but from past experiences we know they do not always succeed.

A department so important as that of education should, in my opinion, not be subject to political changes, or political hazards, but should from the top down be controlled by some such organization as the Board of Regents of New York State, or some educational committee that is elected for more than four years.

Educational matters in this state should be standardized and stabilized.

We trust, however, that while the laws of this state are as they are we will be favored with men like Mr. Shepardson as directors of this most important department.

We will then be safe.

I thank you.

MR. SHEPARDSON (Closing the discussion):

I always somehow think that the best part of my life is the beginning. I have lived in Chicago more of my life than anywhere else, but I often go back to my old Ohio home, especially in my thoughts. I am thinking right now of a little town down there of 1,500 inhabitants. In that place was a man called "Doctor," who occupied the position of dentist in the community. Everybody who knew him looked upon him as a professional man. He was recognized as a leader in the life and thought of the town. He had such a hold in civil, social, professional, and political affairs that when, by and by, another man came and opened an office, a good many people felt a little resentment. But the new dentist brought the same spirit when he came. He, too, was a professional man.

I shall never forget the shock when, a little older in years, I went back to the city of my birth, Cincinnati, and saw in a showcase out on the sidewalk a set of teeth marked \$5.00. It came as a distinct surprise to think that somebody had taken a profession of honor in our community and made of it a commercialized business. I think that the burning question that confronts every professional

man today is, "Are you in a profession or are you following an occupation?" (Applause.)

If dentistry is a profession, it ought to be characterized by professional training, professional ideals, professional honor, and professional pride. I know that in this city and in every city of any size there are people who are following the occupation of dentist without the slightest regard for those things of which every honorable man who has the title of Doctor of Dental Surgery ought to be proud, and I tell you, gentlemen, that these things that you know of and I know of are going on in the city of Chicago and in the state of Illinois right now to the detriment of your profession and to the disgrace of the honest name of dentistry, with reflection on you and on every other man or woman called a dentist.

Now, can we stop advertising dentists? I tell you this old world of ours is undergoing a great change. Two years ago the American people were carefree and indifferent. We have changed our mode of thought, the American people. I was chairman of a republican committee down in Ohio when the republican party in that state was dominated by a saloonkeeper of Cincinnati and there was not a single person in the republican party who dared to get up and say, "You shall not lead us." But within two years, within a few months, you have seen a change. Today there is no one so poor as to bow before a saloonkeeper. Our nation has determined to bar intoxicants. This change was found necessary for the period of the war, in order that American manhood might have the efficiency to fight the foe, and there is no one who raised one single voice against it. Why can we not stop newspaper advertising? There are two ideals in the American mind today. One is "efficiency" and the other "fitness." Is he fit to fight for the flag of his country? Oh! the shame and disgrace that comes to an American citizen when he is told, "You are unfit, unfit to fight for the life of the country that gives you a home, that gives you shelter, that gives you an opportunity to live." Are you fit? I tell you that we can go before the people of Illinois now and demand things we could not do two years ago. When this war is over there is going to be a different citizenship and a different aspect towards life, and a different viewpoint on many questions. You know how your own thought is reshaping and changing and climbing upward as our boys are fighting on the western front. Now is the time to strike.

Come with us. You help the Department of Registration and Education and we will show the people of Illinois whether we cannot stop some of those infernal outrages that have been perpetrated in this city and this state under the name of the honorable profession of dentistry. (Applause.) Now is the time!

DR. GEORGE N. WEST:

In rising to make the motion for a vote of thanks to Dr. Shepardson I want to say that I have been interested in this subject for a great many years. I think that Dr. Shepardson has shown the very method to overcome the difficulty that Dr. Dittmar was deploring that might happen if we had some man who was not of the highest caliber. He has pointed out that if we get a law properly drafted, it will be impossible for such a man to overstep his authority.

I move a vote of thanks to Dr. Shepardson for this wonderful paper, and ask for a rising vote.



THE DENTAL REVIEW

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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THE DENTAL REVIEW SUSPENDS.

With this issue the DENTAL REVIEW ceases to exist. It suspends at the moment of its greatest success.

It might appear unseemly to enlarge on what the DENTAL REVIEW has done for dentistry, but the editor may at least say this, that the Publishers—H. D. Justi and Son—have spared no pains or expense to keep the magazine in the foremost ranks of dental journalism. If the journal has fallen short of achieving the ideal in any respect it is due to the limitations of the Editor rather than to lack of support on the part of the Publishers, and after all these long years of association it is a pleasure for the Editor to give them this credit. The journal has been issued for thirty-two years, during most of which time the present Editor has been at the helm. To be solely accountable for everything that has gone into the magazine for that length of time has been no small responsibility, but there have been so many compensations that the retrospect is most pleasurable.

In looking over the contents the thing that the Editor feels most like apologizing for is the large amount of matter that has gone into the journal from his own pen. In all he has published in the DENTAL REVIEW no fewer than sixty-one papers and 507 editorials, which includes of course all the material written by him and published in the journal while under the editorship of the late Dr. A. W. Harlan, its founder. And it is fitting in the last issue of the journal to pay a tribute to the man whose genius started the publication along lines which assured its greatest measure of success. It was his policy that the DENTAL REVIEW should publish only original

matter and from first to last it has never made a practice of copying from other magazines.

The reason the DENTAL REVIEW suspends is because the publishers do not care longer to look after the details or assume the expense of issuing the magazine.

One pleasant duty remains—to thank Messrs. H. D. Justi and Son for their cordial support during all the years of association, to thank the readers of the magazine for their consideration and tolerance, and to thank the editors of other journals for their uniform courtesy and good will. The Editor feels that he can look back on his long editorial service with nothing but pleasant memories and he sends to all of his friends a greeting of good cheer and heartfelt gratitude.

THE EDITOR'S DESK.

A PERSONAL WORD TO MY READERS.

I cannot close the "Editor's Desk" without a friendly word to my dear Readers everywhere. This department has been my especial delight during the long years in which I have edited the DENTAL REVIEW. Through it I have formed many a friendship, and it has proved a never-failing source of relaxation from the otherwise continual exactions of editorial service.

The reason for this is that my readers have been so charitable as to overlook my shortcomings, and to give me encouragement whenever they have given me anything. To sever this association is the one hard thing about giving up the DENTAL REVIEW.

I have had so many letters from readers bearing on this department that it has been a delight. Some of them have been marked for publication if I wished, but on account of their complimentary character I have seldom wished. It may seem paradoxical therefore that on this my last appearance in this department I make bold to publish the following just received from my good friend, Dr. C. Edmund Kells of New Orleans:

TO THE READERS OF THE DENTAL REVIEW

Did you read "The Old Home" in the October issue? Of course you did—we all did. Can you beat this Editor for everlastingly digging out of

that old desk of his the most unseemly subjects—speaking from a purely scientific standpoint as all of *us* readers are purely scientific men—for a Dental Review?

Here he starts the very new year by fishing out of that same old desk the most holy and beautiful ideals, every word of which could have well been burned into our memories never to be forgotten.

And then a letter to a "dear girl." A "dear girl," mind you, from a man of his age. Isn't that the limit? And such a letter! How many of us could have written such a letter? Don't we envy him because we can't? Don't you think that every "dear girl" that read that letter naturally couldn't help being the better for it?

Such a man as that Editor is! Always striving to make people better in themselves. And then a letter to the "Boys." Now that's more seemly to write to the boys. Where is the boy who would not feel an awakening as each far reaching truth in that letter soaked deep down into his heart?

And now comes this "Old Home" business! That's just going a "little too far," as my little granddaughter said about the "government" when she was told that there would not be much Christmas this year: "Now that's going a little too far. First the government stops making bicycles, then it stops chocolate, and now it's going to stop Christmas."

What's all that "dreaming, dreaming of other days" and all that sort of thing got to do with dentistry? Is it just because that Editor of ours was born in the country, is that the secret of it all?

Well, where does the city boy come in? Suppose I say, "Gone is the little red three story brick house in which I was born, for a modern office building stands in its place." No romance about that!

"Here I am dreaming, dreaming of the days of long ago as I sit at *my desk* two hundred feet above the ground and look across the narrow street and see the modern building which replaces the one in which I spent the happy days of my boyhood. Up and down the alley Frank and I raced our fire engines and whoever first pumped water over the wall was the victor in the game.

"And right under where I sit, two hundred feet below me, was a vacant lot in which we boys found most wild delight. An old cistern with about a foot of water in it stood in a corner of the lot and was a perfect storehouse of wild adventure. It was a fortress and moat all in one, and to scale its sides and drop into its depth and land upon some point of safety and not in the water, and with drawn sword (possibly a lath) cry out to the pursuing foe, 'Come on McDuff, and damned be he who first cries enough,' and all that sort of thing."

Now then, if I'd write all that rot of my boyhood days, in the first place, no one would publish it (me not being an editor or publisher) and in the next place, if it did slip in, no one would read it; but just let C. N. J. fish some such stuff, and maybe not as good, from some old pigeon hole of the Editor's Desk and doll it up with his silvery flow of ideas and *words*, and, believe me, we all would think it was great. And that's what gets me. But I reckon every time the REVIEW comes in we will all continue to turn to the Editor's Desk before reading anything else. God bless our Editor, and long may he continue at his "Editor's Desk." C. EDMUND KELLS.

Who, except Dr. Kells, could have written so encouragingly, and who, even if they could, would have taken the trouble to do so? It is just such evidences of loving interest on the part of my friends that have made the department a thing very dear to my heart, and it is this which brings a wrench when the time comes to say goodby. And yet a rest for my readers may be a good thing for them, and I

feel like congratulating them. As for me I do not expect to rest. I shall write just the same, even if not a word is printed.

BOOK REVIEWS.

PRACTICAL DENTAL METALLURGY. By Joseph Dupuy Hodgen, D. D. S., Professor of Operative Dentistry (formerly Professor of Dental Chemistry and Metallurgy), College of Dentistry, University of California. Revised by Guy S. Millberry, D. D. S., Professor of Chemistry and Metallurgy, and Déan of the College of Dentistry, University of California. Fifth edition—completely revised. 436 pages. Price \$2.50. Published by C. V. Mosby Company, St. Louis, Mo.

From the very first this book has been a great aid to the teacher of metallurgy, and the present volume sustains its reputation in every respect. One of the most interesting chapters is that on "Gold," a subject of perpetual interest to dentists. It is treated in a most fascinating manner, being not only instructive but entertaining. This chapter is illustrated with the various methods of mining gold both primitive and modern. At this time the chapter on "Platinum" will also be found of interest. The dental profession did not appreciate at its full value this wonderful metal till it was limited in its use, and we are all looking forward to the day when it may again be available.

The present volume is worthy of the highest commendation, not only for its original excellence but for the careful manner in which it has been revised.

AN INTRODUCTION TO THE MAMMALIAN DENTITION. By T. Wingate Todd, M. B., Ch. B., Manc., F. R. C. S., Eng. Captain, Canadian Army Medical Corps. With 100 illustrations. 290 pages. Price \$3.00. Published by C. V. Mosby Co., St. Louis.

To one who is at all interested in this subject the present work will prove a most fascinating means of study. The author is modest when he claims only "An introduction to the Mammalian Dentition." because the work is more comprehensive than the title would indicate. The chapters of greatest interest to dentists are those on "The Human Dentition," and "Anomalies of the Human Dentition."

While these chapters are short, they are very interesting and well worth study. The publishers have produced a book in mechanical keeping with the subject matter, with clear type and excellent paper, a rather difficult thing to do in this day of war limitations.

PRACTICAL HINTS

This department is for readers who are busy. Articles, to be available, must be brief—not more than 200 words in length. Any practical idea is welcomed, and due credit will be given for each article published. Every practitioner has many little wrinkles that help him out in daily practice, and if they help him they will help others. Thus they should be published. Send in your practical hints to *THE DENTAL REVIEW*, 810 Masonic Temple, Chicago, Ill.

Sharpening Pyorrhea Instruments:—Always round off the corners to avoid cutting any grooves on the roots. This is very important.—*Earle H. Thomas, Chicago, Ill.*

Contour of the Arch:—Before extracting upper anterior teeth, especially cuspids, for bridges it is often beneficial to take an impression and run up a model of the teeth and gums. By so doing you will find the model a valuable aid in arranging the teeth on the bridge.—*W. O. Fellman, Oak Park, Ill.*

Applying Arsenic to Molars:—If you use the Depressed Aluminum disks with arsenic treatments no doubt you have trouble putting them in a distal cavity of any of the molars, especially the uppers. This can be easily accomplished with a little sticky wax on a right angle instrument, then put the disk to place.—*Y. E. Whitmore, Little Rock, Ark.*

Salivary Calculus for Fillings:—Many years ago while cleaning a man's lower teeth I found eight cavities in the incisors filled with calculus. I finished these off like cement fillings, and I saw these fillings annually for several years, and I never saw better fillings. I charged for each of these fillings. My theory is that decay set in at one time, and then conditions changed and calculus was deposited and remained. But my theory does not explain who excavated the cavities.—*E. J. Perry, Washington, Iowa.*

To Prevent Inaccuracy While Setting Up Teeth:—When making a denture inaccuracy often arises because the porcelain of the teeth, while setting them up, is harder than the plaster of the opposing model, wears it off, and this causes the tooth to occupy an incorrect position. This can largely and very easily be overcome by painting the opposing plaster teeth, before setting up, with shellac or iodine. As soon as the porcelain wears the plaster down it will show up in white spots and caution the dentist to be careful.—*F. Van Minden, Chicago, Ill.*

A Case of Interchangeable Sets Between Man and Wife:—In 1892 I made full sets of teeth for a tall angular Scotchman. In the year 1893 he died. His wife, who was as tall and angular as he, was edentulous also. Being poor, she had none made, so she took his sets upon his death and wore them satisfactorily. While in an "old woman's home" she accidentally broke the lower set. I repaired them and examined the cases and they were as well adapted to her as they were to her departed husband. I suppose, therefore, while he lived they ate one at a time, each using these teeth. Dead men's shoes have been waited for, but I have seen no record of dead men's teeth being put to another's use.—*E. J. Perry, Washington, Iowa.*

Repairing Vulcanite Dentures:—Repeated vulcanizing for repairs will soon cause a vulcanite plate to become brittle and useless. I find it better in many cases to substitute new rubber for the whole denture rather than to keep on repairing a plate. I proceed as follows: cast correct model of denture, remove plate from model and cut into sections with saw. I usually cut the plate out in one piece in the case of a full upper and the remaining part of the plate in from four to six pieces (this is done in such a way as to facilitate parting in the flask). I then reassemble the parts correctly on the model with a small amount of wax. The case is then treated in the same way as a waxed up denture, invest, part, heat up the flask, and remove sections of vulcanite, leaving teeth embedded and pack in the usual way. This procedure takes very little longer than an extensive repair, you will get probably three times the fee and will impress your patient with the permanency of your work.—*A. G. Salisbury, Takaka, New Zealand.*

ATLANTA—AMERICAN INSTITUTE OF DENTAL TEACHERS—JANUARY

The next annual meeting of the American Institute of Dental Teachers will be held at Hotel Piedmont, Atlanta, Ga., January 28, 29 and 30, 1919. Papers on the teaching of war dentistry and an exhibit of war appliances will be the main features and along with these will be the usual papers on teaching methods. All persons interested are cordially invited. Abram Hoffman, secretary, 381 Linwood avenue, Buffalo, N. Y.

STUDY CLASS IN POST-WAR DENTAL WORK.

A course of practical instruction in the most recent and approved methods of war oral surgery has been arranged by the Royal College of Dental Surgery, Toronto, Canada, and the Preparedness League of American Dentists during the week, December 16-21, 1918.

That it may be international in character, instructors of unquestioned ability from the United States as well as Canada will collaborate in the object of giving American dentists the benefits of such knowledge in oral surgery as has been gleaned from actual experience at the front.

Canada now commands a large amount of clinical material which is constantly being augmented by the many wounded soldiers being returned from overseas. The teaching and laboratory facilities of the Royal College of Dental Surgeons have been given over to this object, and the operative clinics will be given in Toronto hospitals.

The number will be limited to one hundred, which will be divided into classes of twenty-five each, thereby insuring the personal attention of the instructors for each member.

Colonel W. H. Thompson, in command of the Dental Corps of Ontario, has extended the privileges of the numerous clinics and the full assistance and co-operation of the military for the purpose of making this course most practical in character. Major W. E. Cummer will instruct in prosthesis and Colonel G. G. Hume who has returned from three years' service overseas, will have much of practical value to impart.

This is an exceptional opportunity, and members of the League should take advantage of it. A fee of fifty dollars will be charged, which goes to the instructors.

Announcement will later be made relative to carrying on this course in the principal cities of the United States.

J. W. BEACH, President, P. L. A. D.

